

2 July 1999

MILITARY OPERATIONS RESEARCH SOCIETY



QDR Analysis: Lessons Learned and Future Directions Mini-Symposium

7-9 April 1998
Johns Hopkins University Applied Physics Laboratory
Baltimore Maryland

Chair
Michael Leonard

Co-Chairs
Jim Bexfield, FS
Dr. Peter Sharfman

UNCLASSIFIED
Approved for Public Release

101 South Whiting Street ♦ Suite 202 ♦ Alexandria Virginia 22304-3416
(703)751-7290 ♦ FAX: (703)751-8171 ♦ email: morsoffice@aol.com
URL: <http://www.mors.org>

DTIC QUALITY INSPECT

19990719 1999

DISTRIBUTION STATEMENT A
Approved for Public Release
Distribution Unlimited

DISCLAIMER

This Military Operations Research Society proceedings report summarizes the findings of a mini-symposium conducted over three days by experts, users and participants interested in the Quadrennial Defense Review. It is not intended to be a comprehensive treatise on the subject. It reflects the major concerns, insights, thoughts and directions of the participants at the time of the Mini-Symposium.

CAVEATS

- ◆ The Military Operations Research Society does not make nor advocate official policy.
- ◆ Matters discussed or statements made during the Mini-Symposium were the sole responsibility of the participants involved.
- ◆ The Society retains all rights regarding final decisions on the content of this Report.

REPORT DOCUMENTATION PAGE			<i>Form Approved</i> <i>OMB No. 0704-0188</i>	
Public reporting burden for this collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302, and to the Office of Management and Budget, Paperwork Reduction Project (0704-0188), Washington, DC 20503				
1. AGENCY USE ONLY (Leave blank)	2. REPORT DATE 2 July 1999	3. REPORT TYPE AND DATES COVERED Workshop Proceedings 7-9 April 1998		
4. TITLE AND SUBTITLE QDR Analysis: Lessons Learned and Future Directions Mini-Symposium			5. FUNDING NUMBERS O & MN	
6. AUTHOR(S) Corrina Ross, Editor Corrina Ross, Publisher				
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) Military Operations Research Society, Inc. 101 S. Whiting Street, Suite 202 Alexandria VA 22304-3416			8. PERFORMING ORGANIZATION REPORT NUMBER	
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)			10. SPONSORING/MONITORING AGENCY REPORT NUMBER	
11. SUPPLEMENTARY NOTES				
12a. DISTRIBUTION/AVAILABILITY STATEMENT Distribution Statement A: Approved for Public Release			12b. DISTRIBUTION CODE	
13. ABSTRACT (Maximum 200 words) This publication is the Proceedings for the "QDR Analysis: Lessons Learned and Future Directions Mini-Symposium"				
14. SUBJECT TERMS			15. NUMBER OF PAGES	
			16. PRICE CODE	
17. SECURITY CLASSIFICATION OF REPORT UNCLASSIFIED	18. SECURITY CLASSIFICATION OF THIS PAGE UNCLASSIFIED	19. SECURITY CLASSIFICATION OF ABSTRACT UNCLASSIFIED	20. LIMITATION OF ABSTRACT UNLIMITED	

MILITARY OPERATIONS RESEARCH SOCIETY



QDR Analysis: Lessons Learned and Future Directions Mini-Symposium

7-9 April 1998
Johns Hopkins University Applied Physics Laboratory
Baltimore Maryland

Chair
Michael Leonard

Co-Chairs
Jim Bexfield, FS
Dr. Peter Sharfman

UNCLASSIFIED
Approved for Public Release

101 South Whiting Street ♦ Suite 202 ♦ Alexandria Virginia 22304-3416
(703)751-7290 ♦ FAX: (703)751-8171 ♦ email: morsoffice@aol.com
URL: <http://www.mors.org>

The Military Operations Research Society

The purpose of the Military Operations Research Society (MORS) is to enhance the quality and effectiveness of classified and unclassified Military Operations Research. To accomplish this purpose, the Society provides media for professional exchange and peer criticism among students, theoreticians, practitioners, and users of Military Operations Research. These media consist primarily of the traditional annual MORS Symposia (classified), their published abstracts or proceedings, special mini-symposia, workshops, colloquia and special purpose monographs. The forum provided by these media is directed to display the state of the art, to encourage consistent professional quality, to stimulate communication and interaction between practitioners and users, and to foster the interest and development of students of operations research. In performing its function, the Military Operations Research Society does not make or advocate official policy nor does it attempt to influence the formulation of policy. Matters discussed or statements made during the course of its symposia or printed in its publications represent the positions of the individual participants and authors and not of the Society.

The Military Operations Research Society is operated by a Board of Directors consisting of 30 members, 28 of whom are elected by vote of the Board to serve a term of four years. The persons nominated for this election are normally individuals who have attained recognition and prominence in the field of military operations research and who have demonstrated an active interest in its programs and activities. The remaining two members of the Board of Directors are the Past President who serves by right and the Executive Vice President who serves as a consequence of his position. A limited number of Advisory Directors are appointed from time to time, usually for a one-year term, to perform some particular function.

MORS is Sponsored by:

- The Deputy Under Secretary of the Army (Operations Research)
- The Director, Assessment Division, Office of the Chief of Naval Operations
- The Director of Command and Control, Deputy Chief of Staff, Air and Space Operations, US Air Force
- The Commanding General, Marine Corps Combat Development Command
- The Director of Force Structure, Resource and Assessment, The Joint Staff
- The Director Program Analysis and Evaluation, Office Secretary of Defense

PREFACE

On 7-9 April 1998 MORS Sponsored a Mini-Symposium titled "QDR Analysis: Lessons Learned and Future Directions" at the John Hopkins University Applied Physics Laboratory in Laurel, Maryland. The purpose of the Mini-Symposium was to identify actions that could be taken, and research that could be carried out over the next 2-3 years, in order to maximize the quality and the utility of the projected 2001 QDR. Lessons learned from the 1997 QDR and similar large scale planning efforts served as a starting point.

This report contains four parts. Part I is the Executive Summary which includes the *PHALANX* article summarizing the result of the Mini-Symposium and the briefing given in June at the annual MORS Symposium. Part II is the report from the Synthesis Group. Part III contains the slides and/or text used by the speakers in the Plenary sessions. In some cases, only paper copies were provided by the speakers. Thus, the web version of this report will not include these presentations. In other cases, the speaker either did not provide a copy of the presentation or provided only an abbreviated summary. As a result, some presentations are represented by summaries prepared from meeting notes. Finally, Part IV contains the reports from the working groups/subgroups. There are three Appendices: (A) contains the Mini-Symposium Terms of Reference, (B) is the List of Attendees, and (C) contains the Biographies of the Plenary Speakers.

This meeting would not have been possible without the excellent support of the MORS staff: Dick Wiles (Executive Vice President), Natalie Addison (Vice President for Administration), Cynthia Kee LaFreniere (Assistant Administrator), Corrina Ross (Communications Manager) and Christine Parnell (Communications Assistant). In addition, MORS gives a special thanks to the John Hopkins University Applied Physics Laboratory for the use of their Conference Center and the excellent support provided by Mr. James Hagan. He not only coordinated their assistance, but also provided the host welcome.

James N. Bexfield, FS
Michael Leonard

TABLE OF CONTENTS

	PAGE
THE MILITARY OPERATIONS RESEARCH SOCIETY	iv
PREFACE	vi
EXECUTIVE SUMMARY	1
SYNTHESIS GROUP REPORT	23
PLENARY SPEAKERS	35
OSD/EXTERNAL PERSPECTIVES	
OSD (Policy)	
Ms. Michele A. Flournoy	
<i>Principal Deputy ASD for Strategy and Threat Reduction</i>	39
OSD (Program Analysis and Evaluation)	
Dr. J. Michael Gilmore	
<i>Deputy Director for General Purpose Forces</i>	47
National Defense Panel	
Admiral David Jeremiah, USN, Ret	
<i>Technology Strategies And Alliances</i>	57
Congress	
Mr. Francis A. Finelli	
<i>Legislative Assistant to Senator Dan Coats</i>	67
SERVICE PERSPECTIVES	
Army	
Dr. Robin Buckelew	
<i>Director, Army Center for Land Warfare</i>	77
Navy	
VADM Conrad C. Lautenbacher, Jr.	
<i>Deputy Chief of Naval Operations</i>	
<i>(Resources, Warfare Requirements and Assessments (N8))</i>	87
Air Force	
MajGen Donald L. Peterson	
<i>Asst Deputy Chief of Staff for Air and Space Operations</i>	97
Marine	
LtGen Martin R. Steele	
<i>Deputy Chief of Staff for Plans, Policies and Operations</i>	119

Future Vision Presentations

“Preventative Defense”

Dr. Ashton Carter <i>Harvard University</i>	129
--	-----

“Models and Joint Warfighting”

MajGen Charles D. Link <i>USAF, Ret.</i>	131
---	-----

“The Army After Next”

Colonel Richard C. Payne <i>Future Battle Directorate, US Army TRADOC</i>	133
--	-----

“The Navy in the 21st Century”

RADM Michael McDevitt <i>USN, Ret Senior Fellow, CNA</i>	135
---	-----

WORKING GROUP / SUBGROUP REPORTS

Overall Force Planning Concepts

Dr. Paul Davis, RAND	143
----------------------------	-----

Shape (Dr. George Akst, CNA)

Forward Presence/Engagement <i>Mr. Bruce Powers, N81</i>	157
---	-----

Small Scale Contingencies and OOTW <i>Mr. Fred Frostic, Booz-Allen & Hamilton</i>	158
--	-----

Respond (Col Greg Parlier, OCSA PA&E)

Combat Operations <i>Col Forrest Crain, CAA</i>	160
--	-----

Information Operations <i>Mr. Stephen E. Meyers, JHU/APL</i>	163
---	-----

Asymmetric Challenges <i>Dr. Bruce Bennett, RAND</i>	167
---	-----

Prepare (Col Tom Allen, AFSAA)

Force Modernization and Advanced Operations Concept <i>Col Tom Allen, AFSAA and Col B.J. Thornburg</i> <i>AVCSA, Center for Land Warfare</i>	171
--	-----

APPENDIXES

(A) Terms of References

(B) List of Attendees

(C) Biographies for Plenary Speakers

(D) Acronym List

EXECUTIVE SUMMARY

Introduction

The first Quadrennial Defense Review (QDR) was held in 1997. It included a comprehensive examination of the defense strategy, force structure, force modernization plans, infrastructure and budget plans with a view into the 21st century. There is pending legislation that would require a QDR every four years.

Purpose

The purpose of the mini-symposium was to identify actions that could be taken, and research that could be carried out over the next 2-3 years, in order to maximize the quality and the utility of the projected 2001 QDR. Potential areas for examination included:

- Types of analysis most useful to senior policy-makers;
- Analyst-decision maker interactions;
- Innovative approaches to large-scale defense planning;
- Relative effectiveness of analytical techniques, and ways to improve them;
- Data collection activities; and,
- How MORS can help.

Structure

The first day consisted of plenary sessions. The morning was devoted to OSD, Congressional and National

Defense Panel perspectives on what was right and wrong with the last QDR and recommendations for the future. The speakers were:

- Dr. Mike Gilmore, OSD/PA&E;
- Ms. Michele Flournoy, OSD/S&TR;
- ADM David Jeremiah, USN, Ret, National Defense Panel (NDP);
- Mr. Frank Finelli, representing Senator Coats; and,
- Gen Larry Welch, USAF, Ret, Panel Leader

This was followed by a luncheon speaker, Dr. Jim Roche (Northrop-Grumman), who provided a corporate perspective and encouraged innovative approaches.

The afternoon of the first day was similar to the morning session except the perspectives were from the Services. The speakers were:

- VADM Conrad Lautenbacher Jr., Navy;
- LtGen Martin Steele, USMC;
- MajGen Don Peterson, Air Force;
- Dr. Robin Buckelew, Army; and,
- LtGen Paul Van Riper, USMC, Ret., Panel Leader.

The first day concluded with a summary and comments by Dr. David Chu, Senior Vice President, RAND.

During the second and third days, four other plenary sessions were held to expose the conference participants to "future vision" thinking in the Services and academic worlds. These presentations were:

- "Preventive Defense" by Dr. Ash Carter, Harvard;
- "Army After Next" by COL Richard Payne, TRADOC;
- "Strategy, Models and Joint Warfighting" by MajGen Chuck Link, USAF, (Ret); and,
- "The US Navy in the 21st Century" by RADM Mike McDevitt, USN, (Ret).

The remainder of the second and third days consisted of working group and subgroup meetings organized around the Shape, Respond and Prepare components of the National Security Strategy. The Chairs and Co-chairs of these groups were:

- Overall Force Planning Concepts — Dr. Paul Davis, RAND
- Shape — Dr. George Akst, CNA
 - Forward Presence/Engagement Subgroup (Mr. Bruce Powers, N81 (Chair) and Mr. Dean Free, N81 (Co-Chair))

- Small Scale Contingencies and OOTW Subgroup (Mr. Fred Frostic, Booz-Allen & Hamilton (Chair) and Mr. Vince Truett, Booz-Allen & Hamilton (Co-Chair))
- Respond — COL Greg Parlier, HQ Department of the Army, PA&E
 - Combat Operations Subgroup (COL Forrest Crain, CAA (Chair) and LTC Dave Hutchison, HQ Army, PA&E (Co-Chair))
 - Information Operations Subgroup (Mr. Wesley L. Hamm, MITRE (Chair) and Mr. Stephen E. Myers, JHU/APL (Co-Chair))
 - Asymmetric Challenges Subgroup (Dr. Bruce Bennett, RAND (Chair) and Dr. Tom Cedel, TASC (Co-Chair))
- Prepare — Col Tom Allen, Air Force Studies And Analyses Agency
 - Force Modernization: Col Tom Allen (Chair)
 - Advanced Operational Concepts: COL B.J. Thornburg, AVCSA, Center For Land Warfare (Chair)
- Synthesis Group — Dr. Jackie Henningsen, OSD(PA&E)
 - Working Group Representatives: Dr. Peter Sharfman, The MITRE Corporation, and Mr. Vern Bettencourt, ODUSA(OR))

Findings: Plenary Sessions

Several speakers commended the achievements of the 1997 QDR, to include the new way of expressing the strategy (shape, respond, prepare) and the analyses associated with readiness/modernization tradeoffs, force/program affordability and the new threats/asymmetric strategies. This said, they then felt free to give advice on how to do it better next time:

More Time. First on everybody's list was the need for more time, most suggesting an earlier start. The roughly four months available for the analysis did not allow for in depth analysis or the full exploration of alternatives.

Better Tools. Almost every speaker cited the lack of good campaign analysis tools. Many complained about TACWAR and attrition-based modeling.

Better Databases. Several stressed the need for better data, especially historical data on force deployments and OPTEMPO.

Improve SSC Analyses. Dynamic Commitment was a good start. In addition, some suggested less emphasis on the two MTW planning scenario; others wanted more emphasis on new threats and nodal targeting.

Greater Collaboration/Collegiality. This tended to be primarily a Service issue. Some Services also wanted a more streamlined QDR organization. The combination of greater collaboration, better tools and better data should help address another concern — the need for improved joint analysis.

More Robust Set of Options. No one seemed happy with the generally modest, pro-rata options used in the 1997 QDR.

Strategy Emphasis. The Services would prefer a strategy emphasis in the next QDR. Several viewed the last QDR as a "cut drill." In this regard, the NDP suggested a tilt toward investing in the future. This view was, to some extent, supported in Dr. Ash Carter's presentation where he stressed the need to keep the "A" list of threats empty. Potential "A" list threats include China, Russia, counter-proliferation and "grand terrorism."

Working Group Reports

Each of the Working Groups/Subgroups and the Synthesis Group produced a briefing that summarized their findings. These individual briefings, along with most of the plenary briefings, are contained in the following sections. In general the working group reports addressed:

Timing. Agreeing with a key plenary session finding, every working group stressed the importance of starting soon. A reasonable first step may be to establish a QDR Planning and Integration Group (QPIG). It could identify potential issues from ongoing efforts and monitor and support the development of the analytical tools, studies and data bases needed to analyze these issues.

Analytical Challenges. First and foremost, future QDR analysis must be able to address the balance questions (e.g., SSC to MTW, forces to infrastructure, active to reserve and

technology to force size) and have a method to integrate the results into a coherent, supportable force structure recommendation. In addition, it needs to:

- Deal better with uncertainty and risk (e.g., alternate world views, costs,...);
- Include both objective and subjective judgments in analyses in a transparent way; and,
- Give visibility to cross cutting effects (e.g., immediate vs. long-term impacts — OPTEMPO on pilot retention).

Use Existing Studies. The QDR planners (the QPIG?) need to integrate on-going scoping activities into their planning and databases. Examples include Defense planning guidance studies, the follow-on to Dynamic Commitment, the responses to the NDP report, DSB studies (e.g., Implementing JV 2010), the Mobility Requirements Study-05 and Service studies. Some suggested that a study clearinghouse be established.

Build Databases. The availability of accurate data was one of the serious limitations of the last QDR. Now is the time to update the DAWMS, readiness, Dynamic Commitment and SSC databases. The threat update for the next QDR should emphasize asymmetric threats of all types: WMD, information warfare and unconventional tactics. Experiments and exercises can be used to jointly explore advanced concepts, information operations, etc. Finally, there is a need to improve data

validation, with an emphasis on cross-Service data.

Improve Models and Simulations. We need better modeling, especially in the areas of space based systems, the human decision process, presence, logistics and communications. There is some concern regarding how much JWARS can help. The QDR planners need to follow JWARS development carefully and build contingency plans for use if some of the planned JWARS capability is not available. We also need to continue to build on the Dynamic Commitment approach. Performing warfare area research to achieve better underpinnings for our theories, models and data is also desirable. Finally, when improving models and simulations we should emphasize:

- Transparency: Being able to understand why we obtained a given set of results;
- Evolution: Improving in key areas while maintaining a link to our past successes; and,
- Redundancy: Continue to provide for a robust set of models that can approach issues from diverse viewpoints and encourage competition between these approaches.

Stress Capabilities Based Planning. Develop a "capabilities map" to improve our understanding of force capabilities/structure linkages across various mission areas (MTWs, SSCs, presence). Use the models and databases described above to compare alternatives using a variety of measures of value. Get away from using force

structure tokens (division, CVBGs, wings, MEFs) as the primary measure of capability.

Organizational Construct. When the final QDR analysis begins in late 2000 or early 2001, an organizational structure is needed with the roles of the players clearly defined. Many felt that the 1997 QDR process could be streamlined, with fewer panels and subpanels. The organizational structure should encourage open, collaborative efforts among OSD, the Services and the JCS.

Analyst Preparation. Analysts need recent experience with tools. This makes the early availability of JWARS all the more important. It is also important to encourage close relationships between operators and analysts so that the resulting analyses will have the right operational flavor. Finally, the analytical organizers of the 2001 QDR should attempt to shape decision maker expectations regarding what analysis can and cannot do for them. Continuous feedback loops between analysts and decision makers could greatly improve the quality and usefulness of the analysis.

How MORS Can Help. MORS can provide a forum for sharing ideas on planning for major studies like the QDR, briefing and reviewing new models and databases, suggesting MOEs for new missions (e.g., shaping activities) and understanding activities and approaches across service lines. It can also be a facilitator for peer review and serve as a clearinghouse for military definitions and terminology.

Summary

In conclusion, the QDR Mini-symposium recommends that DoD:

- Start now (e.g., establish a QPIG);
- Track and coordinate on-going scoping activities;
- Establish a master plan for data collection efforts and models (including fall-backs);
- Investigate alternative integrating methodologies;
- Prepare a capabilities map; and,
- Provide for better interactions with senior officials.
 - Develop a short list of issues/new initiatives; and,
 - Educate decision makers on what to expect from analysis.

1999 Mini-Symposium

Finally, the participants felt that another mini-symposium in late 1999 would be useful. At this conference, OSD, the JCS and the Services could update each other on their recent activities and future plans. Included would be briefings on the scoping activities. The working groups then could identify potential deficiencies and suggest remedies that could be implemented over the final year before the next QDR begins.

QDR ANALYSIS: LESSONS LEARNED AND FUTURE DIRECTIONS

**MILITARY OPERATIONS RESEARCH SOCIETY
MINI-SYMPOSIUM**

7-9 April 1998

**John Hopkins University Applied Physics Laboratory
Laurel, MD**

OUTLINE

- **Introduction**
- **Perspectives on QDR 97 and improvements for QDR 01**
- **Working Group reports**

ORGANIZERS

Chair: Mr. Mike Leonard, Institute for Defense Analyses

Co-Chairs: Mr. Jim Bexfield, FS, Institute for Defense Analyses
Dr. Peter Sharfman, MITRE Corp.

Working Group Chairs:

Overall Force Planning Concepts: Dr. Paul Davis, RAND

Shape: Dr. George Akst, Center For Naval Analyses

Respond: COL Greg Parlier, HQ Army, PA&E

Prepare: Col Tom Allen, Air Force Studies and Analyses Agency

Synthesis: Dr. Jackie Henningsen, FS, OSD, PA&E

PURPOSE

- **Identify actions that could be taken and research that could be carried out over the next 2-3 years, in order to maximize the quality and the utility of the projected 2001 QDR.**
- **Potential Areas Include:**
 - Types of analysis most useful to senior policy-makers
 - Analyst/decision maker interactions
 - Innovative approaches to large-scale defense planning
 - Relative effectiveness of analytical techniques and ways to improve them
 - Data collection activities
 - How MORS can help

STRUCTURE

DAY 1: PLENARY SESSIONS

OSD/ External Perspectives

- OSD/PA&E: Dr. Gilmore
- OSD/S&TR: Ms. Floumoy
- NDP: ADM Jeremiah, Ret
- Congress: Mr. Finelli, rep. Sen. Coats
- Panel: Gen L. Welch, Ret

Service Perspectives

- Navy: VADM Lautenbacher
- Marines: LtGen Steele
- Air Force: MajGen Peterson
- Army: Dr. Buckelew
- Panel: LtGen Van Riper, USMC, Ret

Luncheon Keynote Speaker - Dr. Roche

DAY 2-3: WORKING GROUP MEETINGS

Overall Force Planning Concepts

Respond

- Combat Operations
- Information Operations
- Asymmetric Challenges

Shape

- Forward Presence/Engagement
- Small Scale Contingencies and OOTW

Prepare

- Force Modernization
- Advanced Operational Concepts

FUTURE VISIONS PRESENTATIONS

- Preventive Defense (Dr. Carter)
- Army After Next (COL Payne)
- Strategy, Models, and Joint Warfighting (MajGen Link, Ret)
- US Navy in 21st Century (RADM McDevitt, Ret)

TUTORIAL

- Theory of Moves and Fair Division (Dr. Brams)

CAVEATS

- Subject is both large and complex — generating many different viewpoints and ways of expressing them
- Today's brief represents best effort at synthesis
- Not vetted with presenters, or with most organizers
- More detailed summary of presentations and working group reports to be published later

QDR 97 ACHIEVEMENTS

- **Adjusted strategy: shape, respond, prepare**
- **Looked at readiness-modernization tradeoffs**
- **Started to address new threats/asymmetric strategies**
- **Committed DoD firmly to RMA/RBA and "transformation" to meet emerging needs**
- **Made some progress on force/program affordability**

PERSPECTIVES ON QDR 97 AND IMPROVEMENTS FOR QDR 01

SOME OSD PERSPECTIVES

- **Policy**
 - Emphasize strategy
 - Conduct better preparatory analysis
 - Provide clearer guidance on issue
 - Improve models and data
 - For SSCs and MTWs
 - Particularly to "pull things together" for senior decision makers
- **PA&E**
 - Need more time
 - Consider wider range of alternatives
 - Avoid "across the board" force reductions

NDP AND "A" CONGRESSIONAL PERSPECTIVE

- **National Defense Panel**
 - QDR limitations – budget-driven, traditional flavor
 - Give higher priority to
 - Emerging threats – WMD, asymmetric strategies, transnationals
 - New missions – homeland defense, space
 - Reduce emphasis on 2 MTWs, "legacy" systems and force structure
 - Put greater emphasis on future
 - Move NDP before QDR
- **Congressional**
 - QDR too limited; NDP better
 - Emphasize joint approach – priority to C4ISR, JMD
 - More attention to joint analysis and experimentation
 - Budget problems – O&M, procurement "bow wave"
 - Too little investment in "transformation"
 - Other issues – strategic lift, RCs, new technology/operations concepts/forces

AREAS OF OSD, NDP and CONGRESSIONAL CONVERGENCE

- **Strong**
 - More time
 - Improved SSC analyses
 - More robust set of options
 - Better campaign analysis tools
- **Moderate**
 - Less emphasis on 2 MTW planning scenario
 - More emphasis on new threats
 - Improved joint analysis
 - Greater collegiality
 - Tilt to future

SOME SERVICE PERSPECTIVES

- **Army**
 - Need more time
 - Improve treatment of asymmetric threats, SSCs and readiness
 - Emphasize joint operations, mission/task organization
 - New models must improve treatment of joint operations and information flows
- **Navy**
 - Need to account better for contributions of Maritime Forces
 - Develop more and more stressful scenarios; include presence, SSCs and OOTW
 - Develop better tools, especially to address joint activities and C4ISR
 - Evaluate RMA and RBA more rigorously

SOME SERVICE PERSPECTIVES (cont'd)

- **AIR FORCE**

- Improve models and data bases
- Conduct full spectrum analysis, including MTWs, SSCs, OPTEMPO and infrastructure
- Conduct more joint studies and analyses
 - Expand operational inputs to analyses
 - Support with joint wargames, exercises and experimentation

- **MARINE CORPS**

- Engage top-level leadership actively
- Limit scope to important strategic problems
- Develop models and data bases to cover
 - Information-age warfare
 - Asymmetric threats
 - Chaos and uncertainty

AREAS OF SERVICE CONVERGENCE

- **Strong**

- More time
- Improved SSC analyses
- More robust set of options
- Better campaign analysis tools
- Improved joint analysis
- Greater collaboration/collegiality
- Better data bases
- Strategy emphasis

- **Moderate**

- More emphasis on new threats
- Include "nodal targeting" effects
- Streamline QDR organization

TWO OTHER PERSPECTIVES

- **DR. ASH CARTER**

- Threat classes now covered (~)
 - C list: SSCs, OOTW, etc.
 - B list: MTWs
- Need to work harder on keeping A list empty
 - China
 - Russia/FSU/Former Warsaw Pact
 - Russian WMD
 - Counterproliferation generally
 - "Grand terrorism"

- **DR. DAVID CHU**

- Start early/more time
- Improve models/data bases
- Focus on
 - Strategy
 - Things that can be changed
 - Capabilities vs systems/forces
- Concentrate on producing insights
- MORS role

DATA DEVELOPMENT FOR QDR 2001

- **Army**

- Objective Force Planning
- Army Flow Model

- **Navy fleet battle experiments**

- Consistent with JV 2010
- Operational emphasis
- Doctrinal revolution

- **Air Force**

- Joint exercises, experiments and wargames
- Stress operational experience
- Work within JV 2010 framework

MODELS FOR QDR 2001

- **JWARS and**
- **Army — ARES**
- **Navy — network centric analyses (C4ISR ...)**
 - GCAM — captures value of naval forces
 - NSS — below theater level
 - SEAPWR — presence/crisis response
- **Air Force**
 - Improved TACWAR (if JWARS delayed)
 - Dynamic Commitment
- **Marines**
 - "Information age" warfare
 - Chaos and uncertainty

WORKING GROUP REPORTS

**WORKING GROUP REPORTS
OVERALL FORCE PLANNING CONCEPTS
CHAIR: DR. PAUL DAVIS**

- **Analytical challenges**
 - Illuminate trades
 - Readiness for 2 MTWs vs support for other activities (that draw down readiness)
 - Quality vs quantity as it relates to 2 MTWs
 - Deal better with uncertainty and risk (e.g., alternative world views, costs, ...)
 - Include both objective and subjective judgments in analyses in transparent way
 - Give visibility to cross cutting effects (e.g., immediate vs long-term impacts — OPSTEMPO on pilot retention)
- **Stress capabilities based planning**
 - How much capability of each type is needed
 - Compare choices using different measures of value
 - Get away from using force structure tokens (divisions, CVBGs, wings, MEFs) as the measure of capability

**WORKING GROUP REPORTS
OVERALL FORCE PLANNING CONCEPTS
(cont'd)**

- **Known methods to encourage non-incremental options**
 - Mission based planning: SecDef sets missions, services respond
 - Withhold based planning: SecDef withholds X% Of budget and let Services compete to buy back
 - Excursions: look at capabilities needed for 1+ vice 2 MTWs
- **Innovative methods**
 - Dyna Rank decision support: measure option values in terms of strategy components
 - Exploratory analysis: illuminate solution space using extensive parametric analyses
- **Emphasize**
 - Transparency, diversity, redundancy, competition and evolution in models
 - Close relationship between operators and analysts
 - Warfare area research — better underpinnings for theories, models and data
 - Methodological research

**WORKING GROUP REPORTS
SHAPE
DR. GEORGE AKST**

- **Forward presence/engagement**
 - Mr. Bruce Powers, N81 (Chair)
 - Mr. Dean Free, N81 (Co-Chair)
- **Small Scale Contingencies (SSCs) and OOTW**
 - Mr. Fred Frostic, Booz-Allen & Hamilton (Chair)
 - Mr. Vince Truett, Booz-Allen & Hamilton (Co-Chair)

SHAPE

- **Forward presence/engagement**
 - Presence is applying resources to shape behavior short of war
 - Need better measures (peacetime, crisis response, integration)
 - Dynamic commitment (J-8)
 - Force presence model (PA&E)
 - SEADWR, SEASTATE, GCAM, Impact (N081)
 - Psych/Social (N91/CNA)
- **Small scale contingencies and OOTW**
 - SSCs are everything but MTWs, forward presence, training and exercises
 - Are SSC needs met by 2 MTW force?
 - Focus 2001 QDR effort: clearly define roles and responsibilities of OSD/JCS/Services/CINCs
 - Start now to identify key issues, collect data, develop/improve methodologies
 - Force size and composition still big issue
 - Dynamic Commitment a positive approach, but needs better database
 - Need better tools to estimate needs for logistics and support forces
 - Need to incorporate non-military contributions (US and foreign)

WORKING GROUP REPORTS
RESPOND
COL GREG PARLIER, HQ ARMY, PA&E

- **Combat operations**
 - COL Forrest Crain, CAA (Chair)
 - LTC Dave Hutchison, HQ Army, PA&E (Co-Chair)
- **Information operations**
 - Mr. Wesley L. Hamm, Mitre (Chair)
 - Mr. Stephen E. Myers, JHU/APL (Co-Chair)
- **Asymmetric challenges**
 - Dr. Bruce Bennett, RAND (Chair)
 - Dr. Tom Cedel, TASC (Co-Chair)

RESPOND

- **Combat operations**
 - 1997 QDR - force structure needs analyzed using primarily 2 MTW scenario
 - 2001 QDR
 - Get leadership involved early; designate a "CINC" QDR
 - Help shape decision makers expectations
 - Help scope problems, identify issues
 - Specify strategy, timeframe, scenarios
 - Improve databases — JDS, AFM
 - Improve tools: Will JWARS be ready?
- **Information Operations (IO)**
 - Defensive: protect US infrastructure from hostile IO (may be outside DoD area of responsibility)
 - Offensive: IO capabilities US can use in peacetime, SSCs and MTWs
 - Existing tools inadequate
 - Space based systems
 - Human decision process
 - Links from information to military effectiveness
 - JWARS C4ISR development is risky; may not be ready for next QDR

RESPOND (cont'd)

- Data: coordinate ongoing efforts (service experiments/battle labs)
- Recommendations: establish high level guidance now and fund/organize support structure
- **Asymmetric strategies/threats**
 - Definition: weaker countries attacking US vulnerabilities in ways we do not appreciate or are ill-prepared to defend
 - Disruption (e.g., an attack on DoD computers)
 - Destruction (e.g., a BW attack)
 - Military denial (e.g., mines in the Strait of Hormuz)
 - 1997 QDR — not well understood or analyzed
 - Key needs for 2001 QDR
 - Better threat assessment: think like our adversaries
 - Improved measures of how adversary actions impact US (e.g., CBW); use experimentation, models,...
 - Better analytic approaches (models and databases)
 - Identify effective counter strategies (deter/defeat)

WORKING GROUP REPORTS PREPARE

COL TOM ALLEN, AIR FORCE STUDIES AND ANALYSES AGENCY

- **Force modernization:**
 - Col Allen (Chair)
- **Advanced operational concepts:**
 - COL B.J. Thornburg, AVCSA, Center for Land Warfare (Chair)

PREPARE

- **Issues for 2001 QDR**
 - Strategy based
 - Clearly define threats
 - Identify gaps/overlaps in capabilities
 - Address balance questions
 - SSC to MTW
 - Forces to infrastructure
 - Active to reserve
 - Technology to force size
- **Opportunities to improve**
 - Timing — start now:
 - Establish QDR Planning and Integration Group (QPIG)
 - Identify issues from ongoing efforts
 - Streamline process — panels, subpanels

PREPARE (cont'd)

- Encourage collaborative efforts
 - To overcome defensive behavior
 - To improve cross-service understanding, insight
 - To enhance communication between analysts, decision makers and warfighters
 - To produce effective joint studies and analyses
- Build databases and improve cross-Service data validation
 - Threat updates
 - Experiments and exercises — jointly explore advanced concepts
 - Update DAWMS, readiness and SSC databases
 - Establish study clearinghouse (work through QPIG, DTIC)
 - Capture ongoing JV 2010 Implementation work
- Improve models — and integrate
 - JWARS, LPs, other campaign models and supporting tools
- Develop “capabilities map” to improve understanding of force capabilities/structure linkages
 - MTWs
 - SSCs
 - Presence

SYNTHESIS GROUP REPORT

DR. JACKIE HENNINGSSEN, FS

DR. PETER SHARFMAN

MR. VERN BETTENCOURT, FS

- **Role: summarize with focus on role of MORS and analysis**
- **Scoping activities for 2001 QDR (Prepare or map)**
 - Defense Planning Guidance studies
 - JWARS model development
 - Follow-on to Dynamic Commitment
 - Response to NDP report
 - DSB studies (Implementing JV 2010)
 - Mobility Requirements Study-05
 - Service studies
- **Recommendations**
 - Provide a clear organizational construct
 - To improve methodologies and databases: start with the seven categories from the last QDR (modernization, force structure, strategy, infrastructure, readiness, information operations and human resources) and ask what can be added or subtracted

SYNTHESIS GROUP REPORT (cont'd)

- **Recommendations (cont'd)**
 - Upgrade analyst intellectual preparation — analysts need recent experience with tools
 - Shape decision-makers expectations of what analysis can provide; encourage continuous feedback loops with decision makers
- **How can MORS help — fostering transparency**
 - Serve as clearing house for military definitions and terminology
 - Provide forum for
 - Sharing ideas on planning for major studies like the QDR
 - Briefing new models and databases
 - Suggesting MOEs for new missions (e.g., shaping activities)
 - Understanding activities and approaches across service lines
 - Facilitate peer review

CONCLUDING RECOMMENDATIONS

- **DoD**

- Start soon
- Establish a coherent organizational structure
- Establish master plan for
 - Data collection efforts
 - Models, including fall-backs
- Begin developing a short list of serious issues/initiatives
- Investigate alternative integrating methodologies
- Interact with senior officials

- **MORS**

- Adopt Synthesis Group's recommendations
- Plan to hold another meeting in late 1999
 - Up-date progress/status
 - Identify deficiencies and remedies possible over next year

QDR Analysis - Lessons Learned and Future Directions PART II

SYNTHESIS GROUP REPORT

**Jacqueline Henningsen, FS
Peter Sharfman
Vern Bettencourt, FS
Representatives of Working Groups**

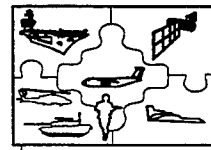
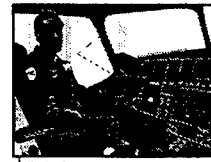
The role of the synthesis group in a special meeting has traditionally been to summarize and to capture cross-cutting insights with potential value for the Sponsors, the broader MORS community and the participants. This particular special meeting on the "QDR Analysis - Lessons Learned and Future Directions" had several unique features that led to a modification of the traditional report. The individual working groups provided excellent reviews of QDR activities and potential future directions in their individual areas, so the synthesis group felt that its important contribution would come from focusing on the way ahead to the next QDR for MORS and for MOR analysts.

The first day of this special session was a mini-symposium with presentations and panel discussions by senior officials with knowledge of the QDR decision process and outcome. Dr. David Chu, Vice President of RAND Corporation, provided an integrated view of the first day activities. In addition to specific remarks that summarize the first day's discussions, he suggested that MORS's greatest contribution in preparations for major reviews like the QDR is in the insights MORS can help produce; real value, he noted, is in illumination. Second MORS can provide a forum in which independence of judgment can transcend the parochial interests of the players.

The next two days of the special meeting used a workshop format with eight working groups under four main categories. Summary reports from these groups are provided elsewhere in these proceedings. The Synthesis group drew insights from many participants, but particularly wish to recognize the following members who acted as advisors or as representatives of the working groups: Dr. Mike Bailey, Major Steve Aviles, Dr. Al Branstein, Dr. Tom Cedel, Mr. Dean Free, Dr. Dean Hartley, Ms Susan Iwanski, Dr. Roy Rice, Dr. Bob Sheldon, Mr. Ted Smyth, COL B.J. Thornburg, LTC Mark Youngren, Mr. Clayton Thomas, FS and Dr. Jerry Kotchka.

OVERVIEW

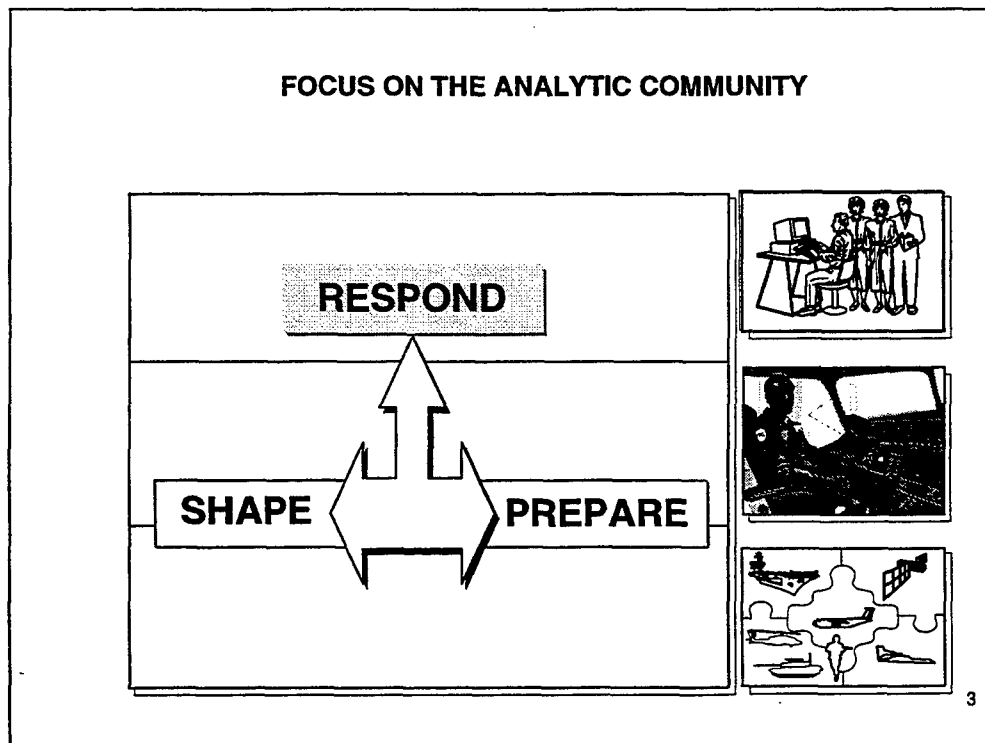
- **Working Group Insights**
- **Strategy for Analysts**
 - Respond
 - Prepare
 - Shape
- **Strategy for MORS**



2

The working group reports each have unique insights about their specific areas of responsibility. The overarching structure of the reports seemed to cover five main categories that can be loosely identified as: (1) Concerns with the QDR purpose and/or process; (2) Issues related to perceptions about the adequacy of current and proposed tools and data bases; (3) Views about how well analysis did or did not “influence” or support the last QDR; (4) Reports of very positive activities that have spun-off from the last QDR and of active preparations for the next QDR; and (5) A desire to let the Sponsors know that analysts are energized to provide value to the QDR process but are anxious to get the earliest possible understanding of the organizational structure so they can best provide this support.

Reading the individual reports is the best way to study these insights. However, with regard to the third category, it was interesting to note that groups that generally discounted the value or influence of analysis in the last QDR frequently reported that “in their case” longer-term foundation analysis helped to support preferred outcomes. In particular, all three Services noted that their ability to provide analyses that supported their positions on key issues helped them defend service positions.



One speaker summarized the value of the analytic foundation as absolutely necessary, but (understandably) not sufficient to make a case for the key issues.

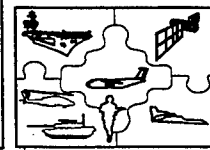
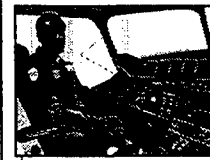
The national military strategy of "Shape, Respond, Prepare" emerged as a key component of the QDR. As the synthesis group focused on overarching insights from this special meeting, the concept of a strategy for analysts and for MORS developed.

FOCUS ON THE ANALYTIC COMMUNITY

RESPOND

The Community will respond but the Decision Maker can help determine the quality (and thus the value of the response).

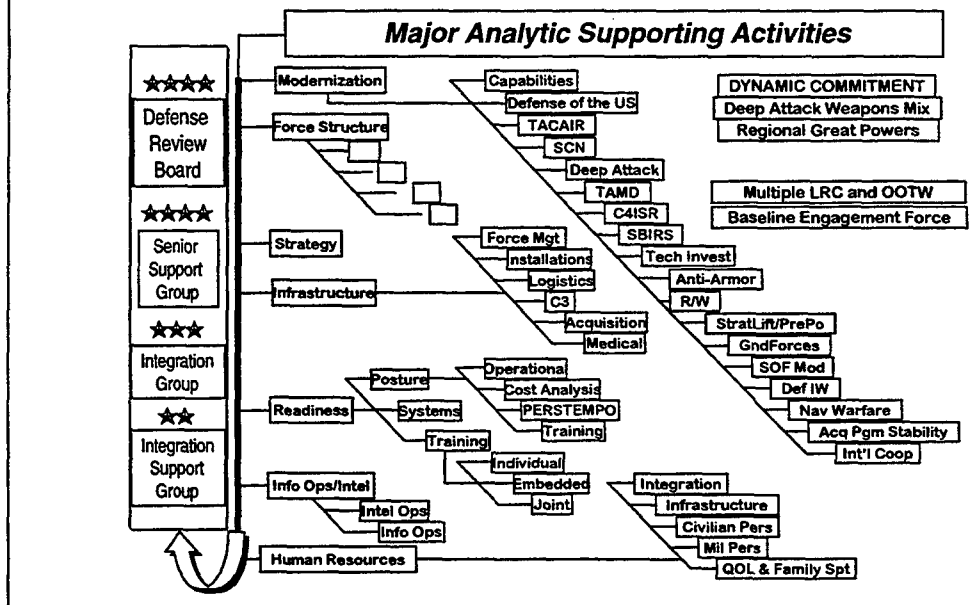
It is a resource investment issue where the resources are analysts, operators, academics, decision makers, time, knowledge, capabilities, stewardship and guidance



4

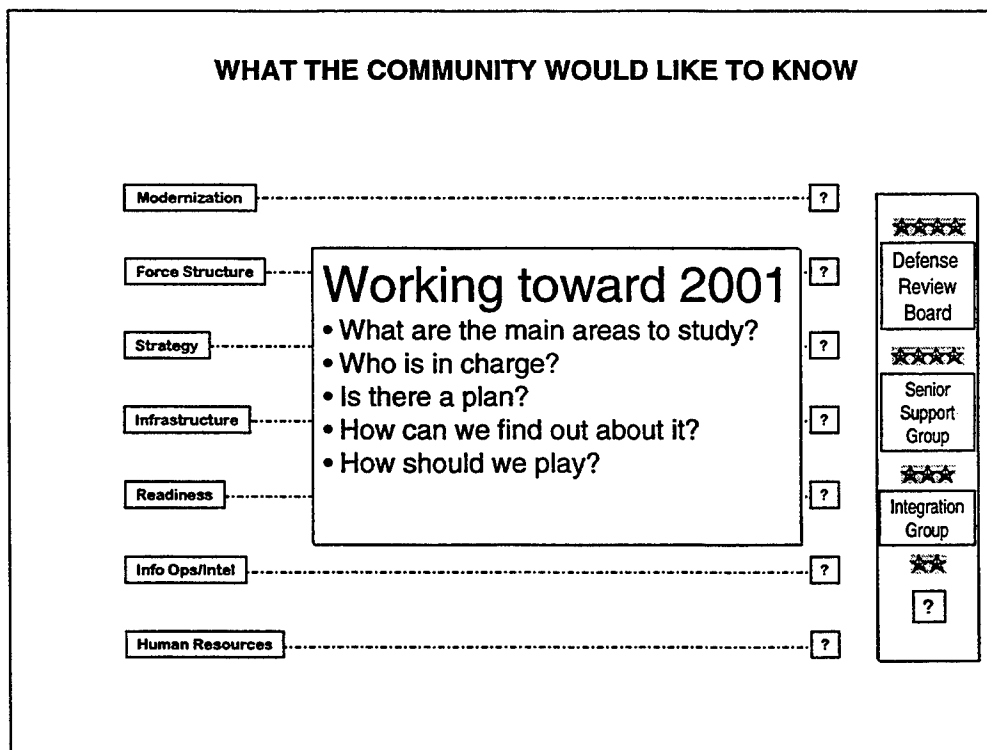
RESPOND is the easiest part of the triad to discuss from the view of the analyst. Analysts will respond loyally and expeditiously at the direction of the decision makers. They will note that adequate time is a factor in providing quality analysis, but will admit that many other factors will have strong influence. Some of these factors were discussed in the MORS *Quick Response Analyses Methodologies* (QRAM) Special Meeting in October 1996 that was held in preparation for the QDR. Some factors that affect the quality response were clear statement of the problem, ability to reframe the problem in analytic terms, ability to communicate with the decision maker, status of useful tools and databases, and intellectual preparation of the analysts. Ways of influencing some of these factors will be discussed further under PREPARE. Dr. Paul Davis of RAND, who chaired the QRAM Synthesis Group, called for a contract between decision makers and analysts that would help forge an understanding of how strongly the response of analysts is influenced by factors that can be controlled with adequate preparation.

STRUCTURING THE REVIEW: QDR ORGANIZATIONAL OVERVIEW



This slide showing an overview of activities during the QDR, was used during the mini-symposium portion of the meeting by a couple of the presenters in order to show the heavy burden on staff's trying to support the large range of activities. It shows the seven major study areas of Modernization, Force Structure, Strategy, Infrastructure, Readiness, Information Operations and Human Resources being fed by a variety of study teams. The results are shown as flowing into an integration support group and up through the levels of decision authority. Of course the actual flow was not as neat as even this rather complicated graphic indicates. Not all the efforts identified with a box were actual studies. Some were meeting groups. The flow of information was not uniform over the time of the QDR or the organizational links implied by the structure. Many of the studies and groups started work long before the QDR was initiated. Others existed in name only.

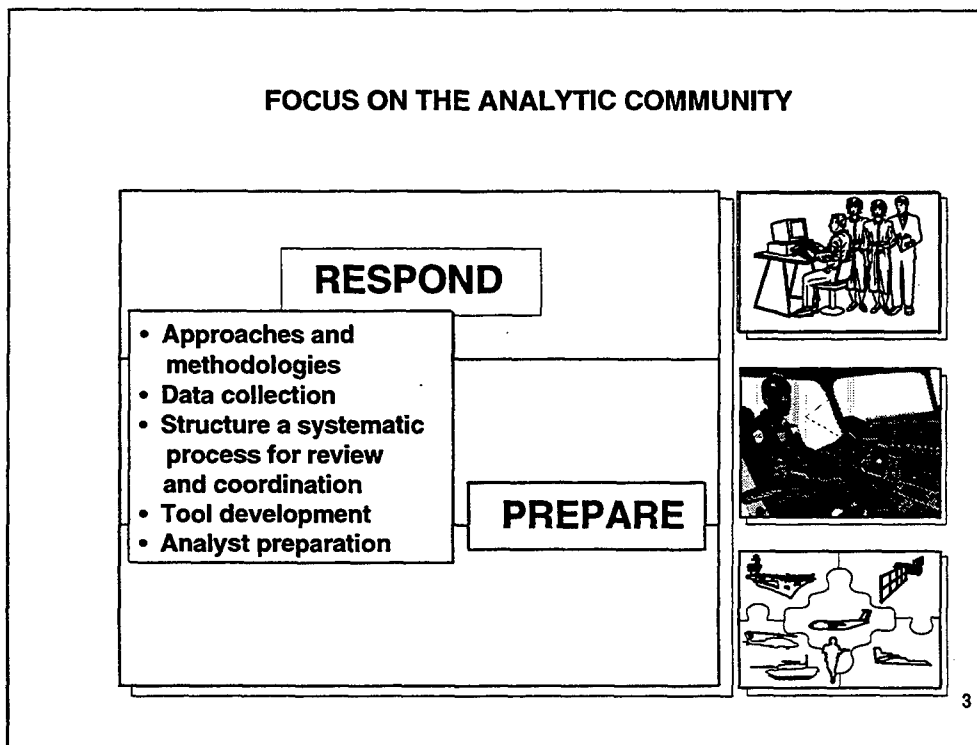
The synthesis group suggested that the mini-symposium participants (and their organizations) might want to look more closely at this list of efforts and consider who led each effort, what was the body of analysis (if any) that supported the work, what is the status of any continuing work and what expectation is there that this work will be part of the next QDR. It is reasonable to expect that the picture could be even more complex if a full four years worth of effort leading up to the next QDR was carefully mapped.



Many participants worried that there was no consistent effort to prepare for the next QDR. However, after listening to the working groups, it became clear to the synthesis team that there are already within the Services, Joint Staff, OSD, and the broader military operations research community a series of studies in progress that will serve as “scoping” studies for the next QDR. The term scoping is used to define efforts that are used by organizations to examine the sensitivities and issues that are worth more detailed analyses.

In addition, several foundation studies and data base development efforts have already been identified as part of the Defense Planning Guidance, the JWARS development effort, the Service’s follow-on to Dynamic Commitment as well as their individual priority work, response to the National Defense Panel report, various Federally Funded Research Development Center (FFRDC) activities, Defense Science Board studies and various other efforts. The results of these studies may have varying use in the next QDR, but they can be identified even now.

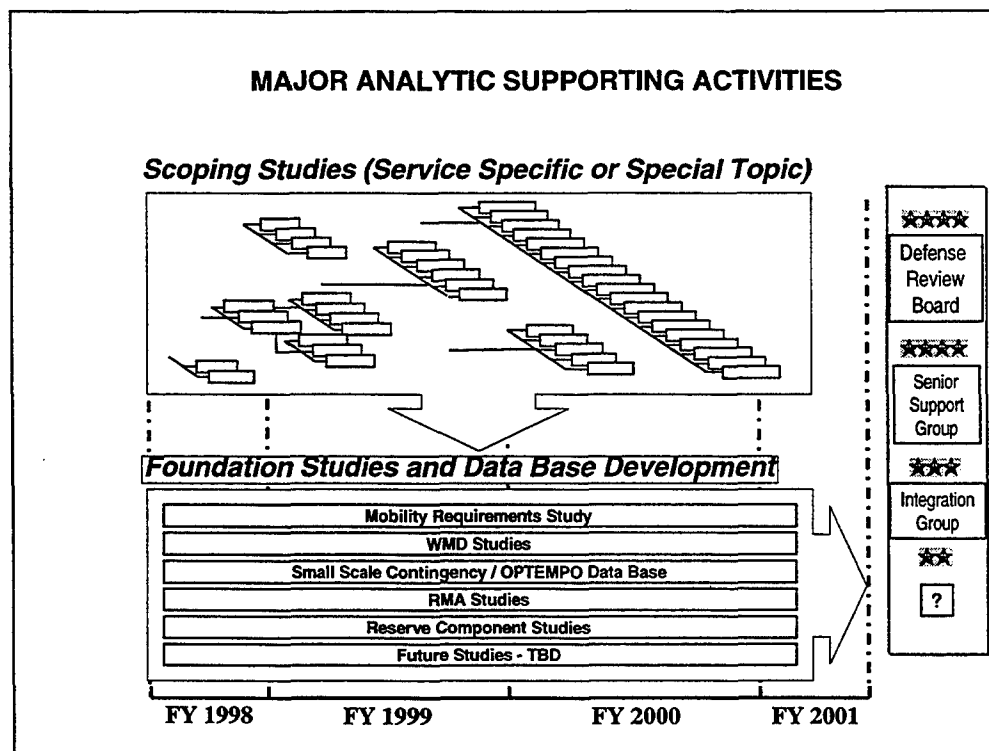
Laying out a path to the next QDR is possible using the published timelines of some of the foundation studies. In most cases these studies have identified the study leaders and reporting relationships. It is also possible for individual organizations to identify their requirements for scoping studies. Symposium participants strongly encouraged the decision makers represented on the right side of this chart to identify the processes by which these and other study efforts would be integrated prior to the next QDR in order to optimize efforts.



One of the speakers used the term being in tune with the “Battle Rhythm of the Government.” Analytic preparation involves not only understanding the larger organizational and study structure as discussed on the previous slide and not just considering the tool development, which was widely discussed, but more importantly understanding the appropriate approaches and methodologies as well as the development of required data bases. To move in time with the rhythm, one must know the steps and the appropriate time to use them. Participants had mixed opinions about various tools and methodologies, but they agreed that the sooner a plan for preparation for the next QDR could be developed and shared with the broader community that supports the decision maker, the better the analysts would be able to respond. The synthesis group summarized this desire to participate by suggesting that the first step might be to examine the seven major categories from the last QDR and ask what would be added or subtracted and why. This is explored on the next chart.

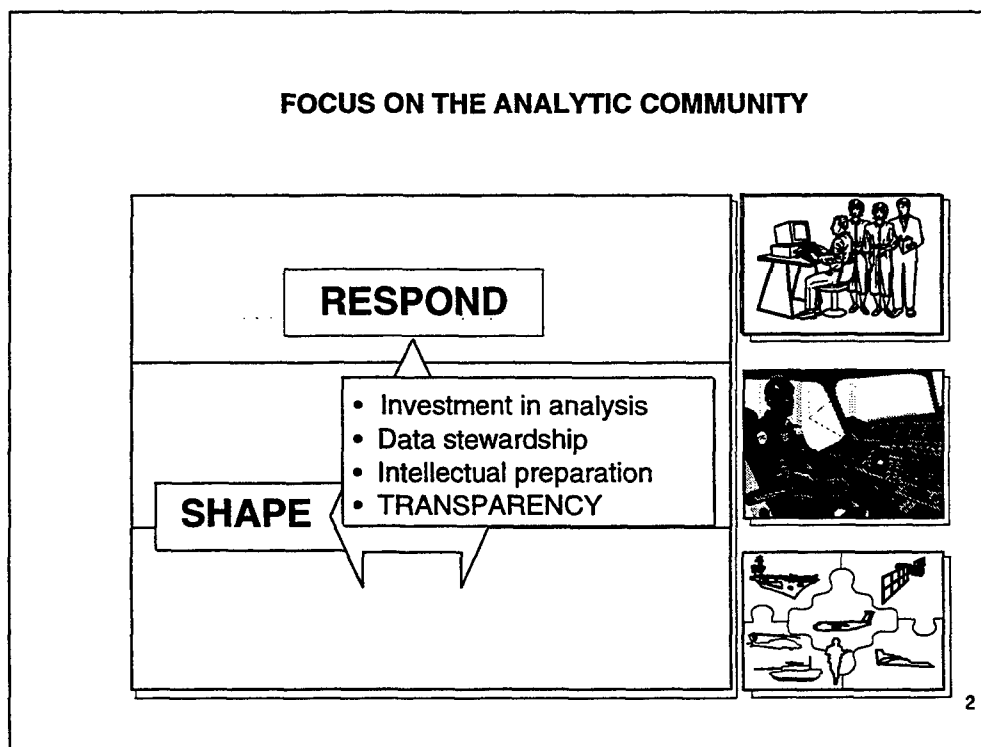
There is another aspect however, and that entails the preparation of a professional analyst. MORS focused the 1998 Education Colloquium on “Sharpening the Saw”— which stresses the importance of providing analysts an opportunity to upgrade their intellectual preparation as well as skills and competencies.

In addition each group stressed the importance for data collection processes, but at least one went on to point out that data collection must be focused to support a clearly defined product. For instance, efforts during the QDR ranging from trying to understand the outcome of different versions of TACWAR to trying to understand OPTEMPO in relation to global engagement were all dependent on the quality and the specificity of data.



Understanding the role of Service specific and agency specific studies in preparing for and feeding the foundation studies is also important. A few examples of anticipated foundation studies are listed above. Participants agreed that it would be useful to have a good mapping of timelines for these types of studies.

In another area of preparation, several groups discussed the development focused on the status of JWARS for the next QDR and the use of TACWAR in the last QDR. There were experts closely tied to both issues who participated in the mini-symposium. Their counsel was to continue to maintain capability in TACWAR, but to begin to look for opportunities where early aspects of JWARS can give insights. Of course, the organizations that specifically use TACWAR are limited, and those that will have access to JWARS in time for the next QDR will be equally small.



In the area of SHAPE, analysts need to work diligently to clarify the decision makers expectations of what analysis can provide. As Dr. Chu noted, analysts can help scope problems and define issues, their tools can be used to research for the “knee in the curve,” the point of least return and the most non-productive extremes. Analysts can not, however, provide an answer more precise then the methods allow, and they should not merely support an agenda. So that leaves them with an interesting problem at the hand-off point when information is provided to a decision maker. This is where analytic studies can be augmented by the creative use of presentation methods to clarify an outcome, where the benefit of integration of operators in to the total process is most evident, and where the use of continuous feedback loops with the decision maker have the greatest value. The latter allows the decision maker to SHAPE the process of the analysis to meet emerging needs.

The decision maker can also shape the quality of analysis by investing in the intellectual preparation, continued training, opportunities for operational interface and overall development of the analysts. More fundamentally, SHAPE requires an investment in transparency. The opportunity cost of this investment will be in supporting peer review, in encouraging alternative analyses and in opening doors to examination of non-intuitive threats and scenarios. The payback will be a stronger foundation for decision making.

At the highest level, shape involves data stewardship, not just data collection. Stewardship requires decisions about oversight, resource investment, acceptable levels of quality and appropriate levels of oversight.

HOW CAN MORS HELP?

- **Fostering Transparency**
 - Terminology Lists
 - “Studies” Sharing Opportunities
 - Discussion Topics
 - Profiles in Analysis
 - Proposal for a Special Meeting
 - Sharing Preparations for the next QDR: study plans, methodologies and tools
 - Sharing of Seminal Studies
 - Shaping the Expectations of Decision Makers
 - QRAM (really)
 - Analytic Implications of the Strategy

So what can MORS do to help prepare for the next QDR?

MORS provides an ideal venue for fostering transparency. This particular special meeting provided many opportunities for decision makers and analysts to share information and views as well as details of current studies. Some specific suggestions from participants included recommendations that MORS serve as a clearing house for military definitions and terminology. Using the web site, it was suggested that members close to the action could update a posted web site.

The synthesis group also recommends the following actions be considered:

- A future Education Colloquium or special session focusing on “What Constitutes a Professional Military Analyst.” Profiles of current highly respected analysts, an opportunity for decision makers to define their “ideal” analyst, feedback from junior-senior analysts sessions and information on opportunities to upgrade skills could be included.
- To foster transparency and encourage analytic preparation, the Sponsors might consider a special MORS mini-symposium including
 - A day in which key organizations in the QDR process share insights into their planning timelines to prepare for the next QDR
 - One and one half days of presentations on seminal (foundation) studies that those supporting the QDR should see and understand (for example past studies like DAWMS, the study plan for current studies like the Mobility Requirements Study) with discussion.

Concluding Thoughts

We have focused on the application of the components of the National Military Strategy; RESPOND, PREPARE, SHAPE to the military analyst and to MORS. The individual working groups have covered a number of specific areas of interest. One cross-cutting component needs a separate mention. The implications of the SHAPE aspect of the strategy still require a substantial amount of analysis. Questions of how to measure the value of shaping when it prevents escalation have been explored in the past in relation to deterrence. Satisfactory cost estimating methods have usually not been satisfactory. Further questions of the impact on resources of this strategy will also require quality analysis in a clear operational foundation.

These are just a few of the emerging issues. As we approach the millennium there are some very interesting issues for MORS and military operations research analysts to consider.

PART III

Plenary Sessions

CONFERENCE OVERVIEW AND PERSPECTIVE

Michael Leonard
7 April 1998

PAST “MACRO” FORCE PLANNING EFFORTS

- **NSSM-3 (1969)**
- **NSSM-246 (1976)**
- **PRM-10 (1977)**
- **NSR-12 (1989)**
- **Base Force (1990)**
- **BUR (1993)**

CONFERENCE OVERVIEW

- **Presentations**
 - QDR experience and subsequent activities
 - Business perspective
 - Future visions
 - Academic perspective
- **Workshop**
 - Overall force planning concepts
 - Shape
 - Respond
 - Prepare
- **Wrap-up session**
- **Administration**

KEYNOTE PRESENTATIONS

OSD POLICY:

**Ms. Michele A. Flournoy, Principal Deputy ASD for
Strategy & Threat Reduction**

OSD ANALYSIS:

Dr. J. Michael Gilmore, Deputy Director, OSD (PA&E)

NATIONAL DEFENSE PANEL:

**Admiral David Jeremiah, USN, Ret, Technology
Strategies And Alliances**

CONGRESS:

**Mr. Francis A. Finelli, Legislative Assistant to Senator
Dan Coats**

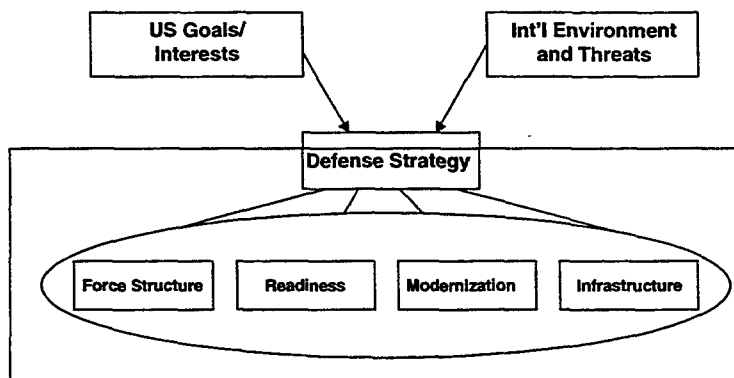
OSD POLICY PERSPECTIVE ON THE QUADRENNIAL DEFENSE REVIEW

Ms. Michele A. Flournoy
Principal Deputy Assistant Secretary of Defense for Strategy
and Threat Reduction

April 1998

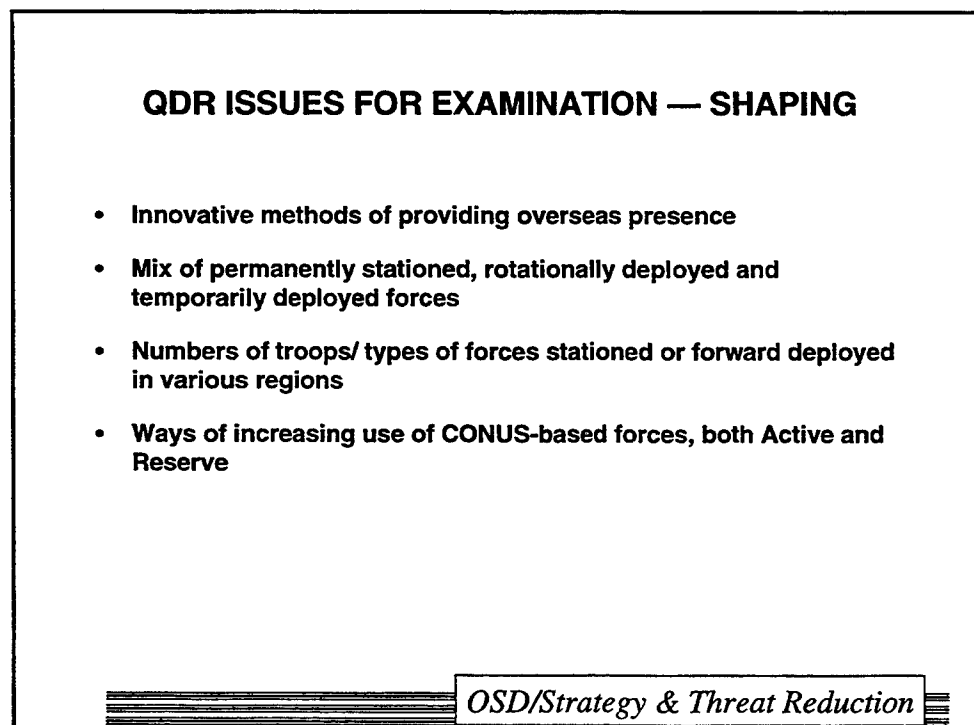
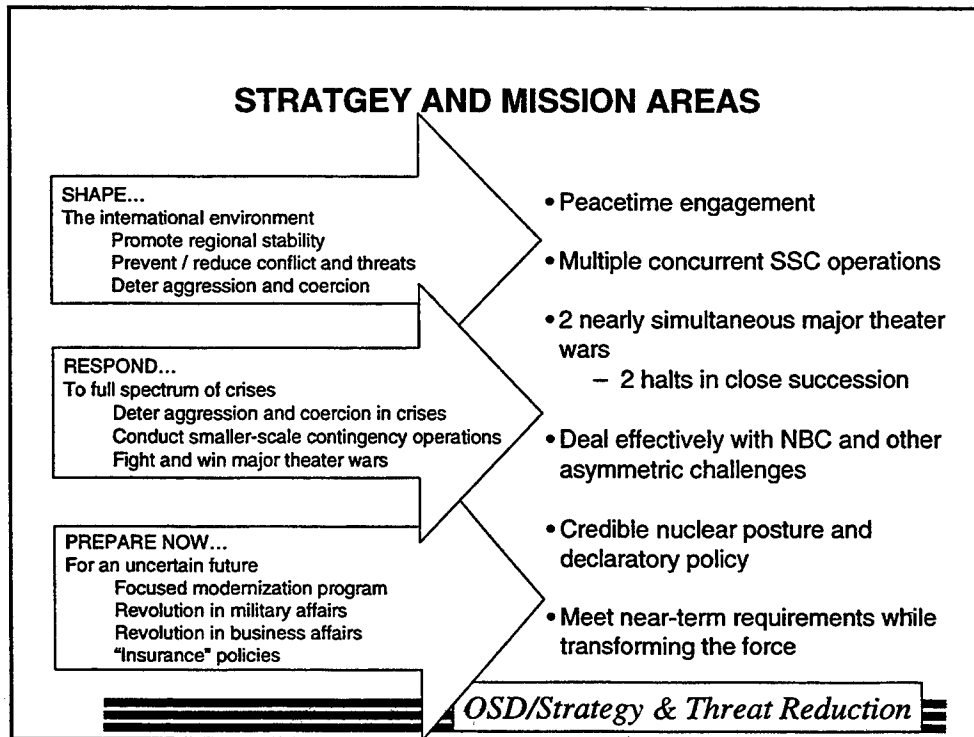
OSD/Strategy & Threat Reduction

QDR FRAMEWORK AND OBJECTIVES



Goal: *Blueprint for a balanced defense program that protects and advances our interests in the world.*

OSD/Strategy & Threat Reduction



QDR ISSUES FOR EXAMINATION — SSCs

- How to increase interagency, NGO and coalition capabilities for SSCs
- Whether to increase forces with certain types of capabilities in high demand for SSCs, both combat and deployable support forces (CS/CSS)
- Whether to change the mix of AC and RC forces in key capability areas
- How to ensure that forces employed are sufficient to accomplish the mission, yet learn and tailored to the task
- How to better manage the PERSTEMPO/OPTEMPO and warfighting readiness impacts of these operations

OSD/Strategy & Threat Reduction

QDR ISSUES FOR EXAMINATION — MTW

- Requirements associated with fighting and winning major theater wars in which CB weapons and other asymmetric strategies are threatened or used
- How to transition from ongoing contingency operations to an MTW
- What forces, including deployable support forces, swing from first major theater war to second
- Timelines associated with counteroffensives, including timelines for mobilizing selected reserve components
- Utilization of coalition and reserve component forces
- Impacts of new technologies and operational concepts

OSD/Strategy & Threat Reduction

QDR ISSUES FOR EXAMINATION — PREPARE

- **How to encourage and facilitate innovation across the military and the Department**
- **Alternative approaches to S&T, R&D and procurement to shorten cycle times and lower costs**
- **Adequacy of I&W capability for potential hedge threats and assessment of options for improvement**
- **How to integrate hedging into modernization strategy**

OSD/Strategy & Threat Reduction

CRITICAL STRATEGIC ENABLERS

- **Identify capabilities clearly required to carry out the strategy, e.g.:**
 - Multi-mission capable forces
 - Forward deployed/stationed forces
 - Power projection forces
 - Strategic lift
 - World wide infrastructure
 - Sea, air and space superiority
 - Global intelligence system
 - Global communication system
 - Highest quality people, ready forces

OSD/Strategy & Threat Reduction

SCENARIOS

- **Emerging near peer competitor**
 - Generic Composite Scenario 2010-2014
- **Traditional MRCs w/ excursions**
 - Iraq w/ Excursions: WMD, Iran Limited Access, Asymmetric Strategies
 - Korea w/ Excursions: WMD, Limited Access, Asymmetric Strategies
- **Range of smaller scale activities**
 - Large Stability Operation
 - Significant Peace Operation
 - Smaller Intervention
 - Humanitarian/ Disaster Relief
 - NEO
 - Counterterrorism/ Counterproliferation
 - Sanctions Enforcement

OSD/Strategy & Threat Reduction

OVERALL EVALUATION OF QDR

- **Much went well...**
 - Strategy set out guidance, required capabilities, and issues for examination
 - Integrated options reflected tradeoffs among different elements of strategy
 - Policy review throughout process and participation in final decisions
- **But not everything...**
 - Needed more preparatory analysis
 - No system in place to ensure that all questions addressed
 - Issues for examination not directive enough
 - Modeling
 - Limited number of model runs
 - Limited number of force structure options
 - Limited tools for missions other than theater war
 - Risk assessments — limited decision-making tools to quantify benefits, costs, and risk of options

OSD/Strategy & Threat Reduction

REQUIREMENTS FOR ANALYTICAL COMMUNITY

- **Peacetime analysis**
 - Data
 - Capabilities required for SSCs
 - Tools to examine force tempo
- **Theater war models**
 - Better model current and future operations
 - Quicker turnaround
 - Develop and analyze more force option
- **Decision-making and risk assessment**
 - Construct complex decision matrices with common risk-benefit measures

OSD/Strategy & Threat Reduction

PEACETIME FORCE MANAGEMENT ANALYSIS

- **Historical deployment data not readily available**
 - Data is spotty and often poor quality
 - Need to start collecting and keeping good data now for the next QDR and beyond
 - Must be able to tell what our forces are doing — exercises, operations, field training, etc.
- **Tools to analyze the capabilities required for a wide variety of SSCs**
 - Identify important capabilities and efficiencies
- **Tempo analysis**
 - Broaden the scope to cover all (including CS/CSS) personnel
 - Be able to analyze tempo by type unit, type weapon system or type personnel as appropriate
- **Support both the next QDR and ongoing force management initiatives**

OSD/Strategy & Threat Reduction

WARTIME ANALYSIS CHALLENGES

- **Must develop models that adequately represent current and future concepts of operations**
 - Attrition-based models are not adequate
 - Need to show effects of indirect activities (e.g. C4ISR, strategic interdiction, maneuver schemes, etc.)
- **Models must be easier to set up and run**
 - Quicker turnaround to answer questions in a time crunch
 - Allow us to investigate more variables and force options
 - Possibly develop new force options
- **Model output**
 - More meaningful and discriminating measures of merit

OSD/Strategy & Threat Reduction

DECISION MAKING CHALLENGES

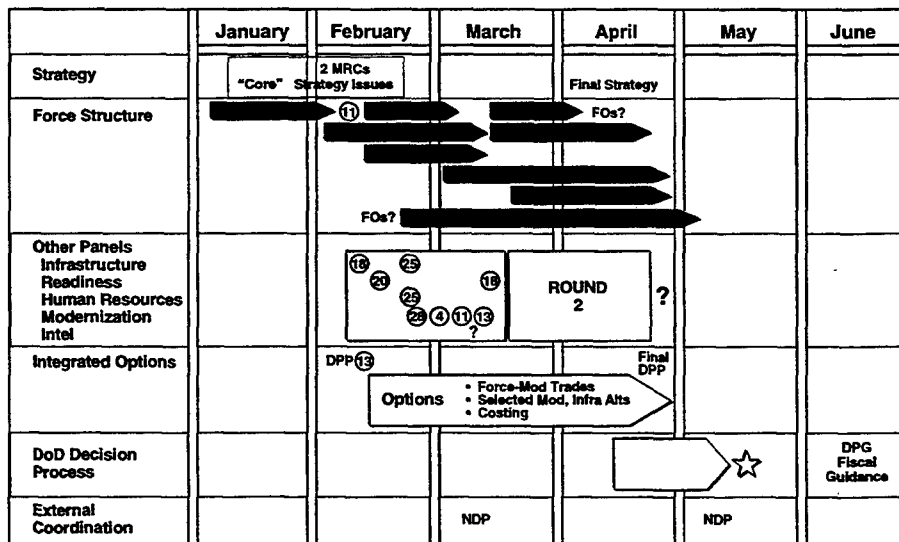
- **Need more responsive decision analysis tools**
 - Organize and construct complex decisions
 - Collate and match disparate individual analyses into unified, coherent options
 - Cut across service lines
 - Quantify important measures of merit
 - Each option should have quantifiable or clearly identified
 - Consequences - desirable and undesirable
 - Costs
 - Risk
 - Be able to construct these decision aids within a week or two
- **Clearly defined options will enhance our ability to make our decisions**

OSD/Strategy & Threat Reduction

The Quadrennial Defense Review OSD ANALYSIS 7 April 1998

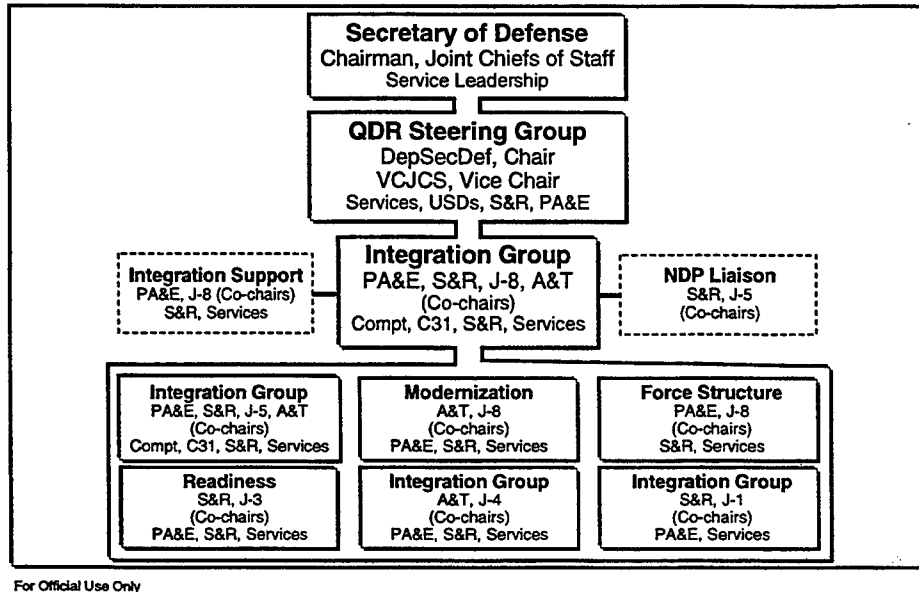
Dr. Mike Gilmore
Deputy Director, General Purpose Programs
OSD/PA&E

QDR MASTER SCHEDULE

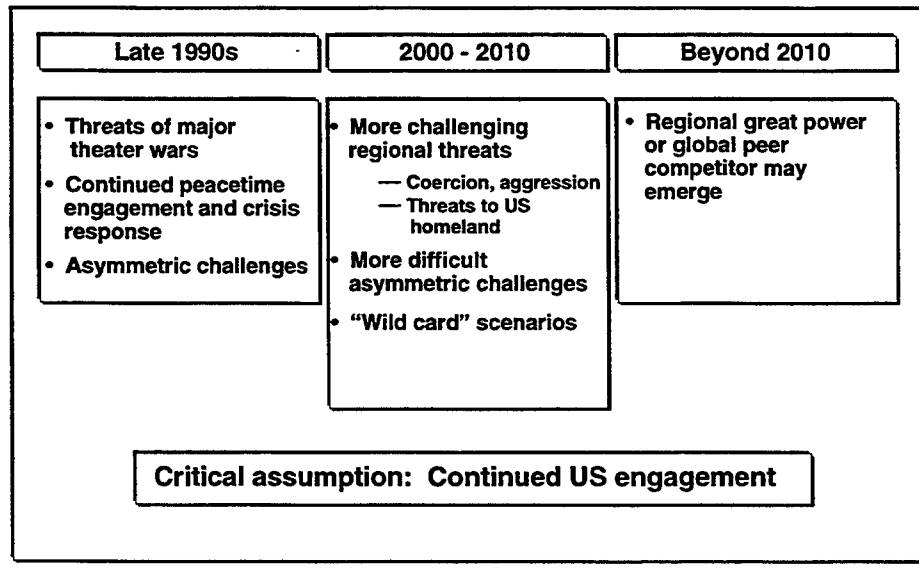


⑪ = Steering Group Meeting

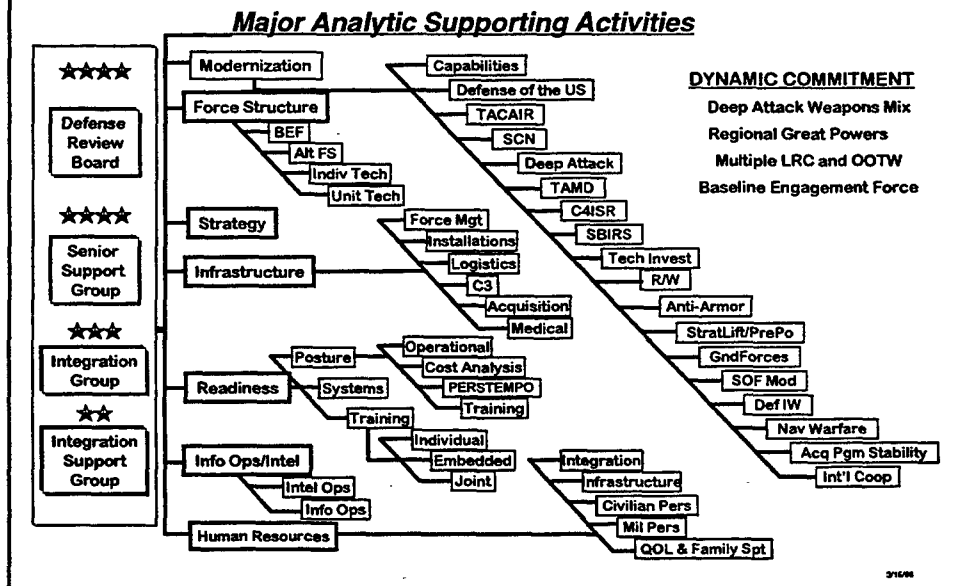
ORGANIZATION



SECURITY ENVIRONMENT



STRUCTURING THE REVIEW: QDR ORGANIZATIONAL OVERVIEW

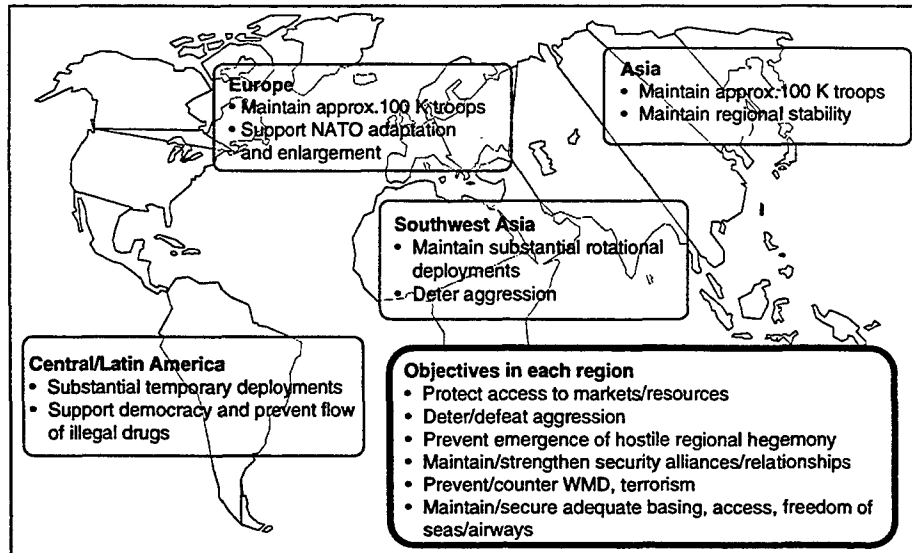


BACKGROUND: STRATEGIC TRANSITION

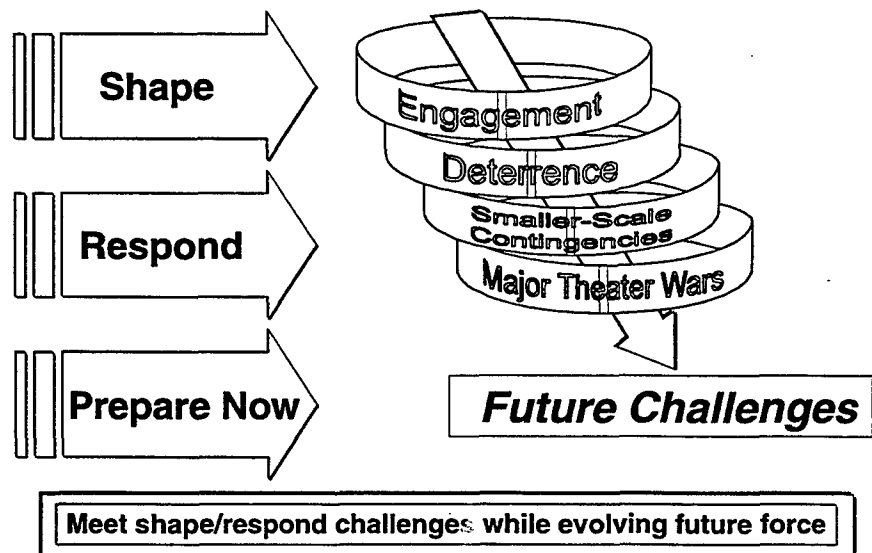
1950s-1980s	1990s and beyond	
Containment and Deterrence	Transition	Engagement and Enlargement
Cold War (Confrontation with Soviet Union) <i>Force design:</i> In case the strategy fails	Base Force (Initial post-cold-war shift)	<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> BUR <ul style="list-style-type: none"> • 2 Major Regional Contingencies <i>Force design:</i> </div> <div style="width: 45%;"> QDR <ul style="list-style-type: none"> • Potential emergence of new threats • High pace of operations • Modernization challenge </div> </div>
So the strategy can succeed		

Not a strategic pause, an historic strategic opportunity

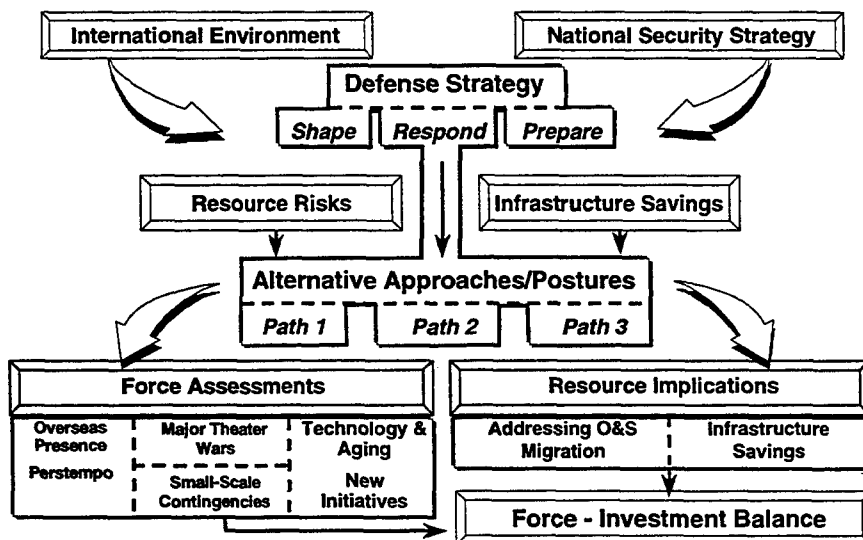
BACKGROUND: OVERSEAS PRESENCE POSTURE



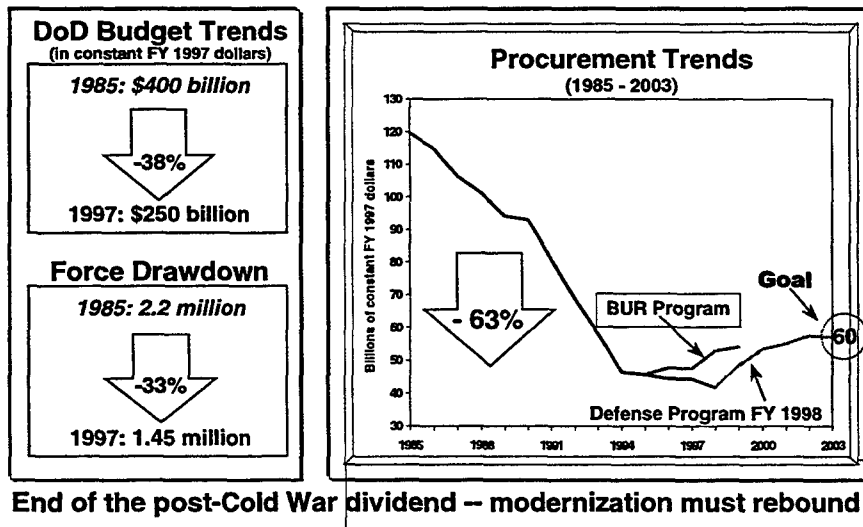
US DEFENSE STRATEGY



STRUCTURING THE REVIEW: QDR ANALYTIC PROCESS



ANALYSIS OF TRENDS



ALTERNATIVE PATHS

Path 1 – Focus on near-term demands

- Emphasizes preserving the current force to respond to near-term threats in SWA and NEA and to sustain the high pace of forward deployments and smaller-scale contingencies
- Accepts risk of achieving only small increases in modernization beyond current levels

Path 2 – Preparing for a more distant threat

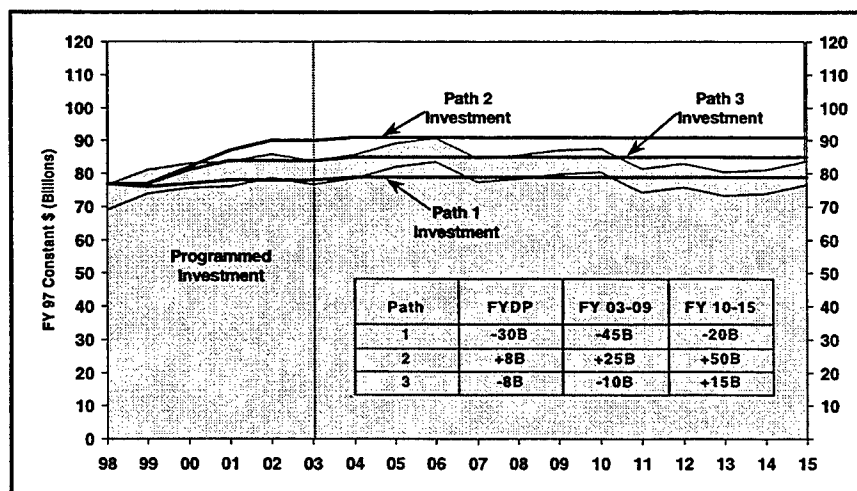
- Emphasizes modernization and technology programs to address prospect of regional great power or more stressing asymmetric threats

- Accepts risk of being unable to address more than one regional conflict and of having to reduce current levels of overseas presence

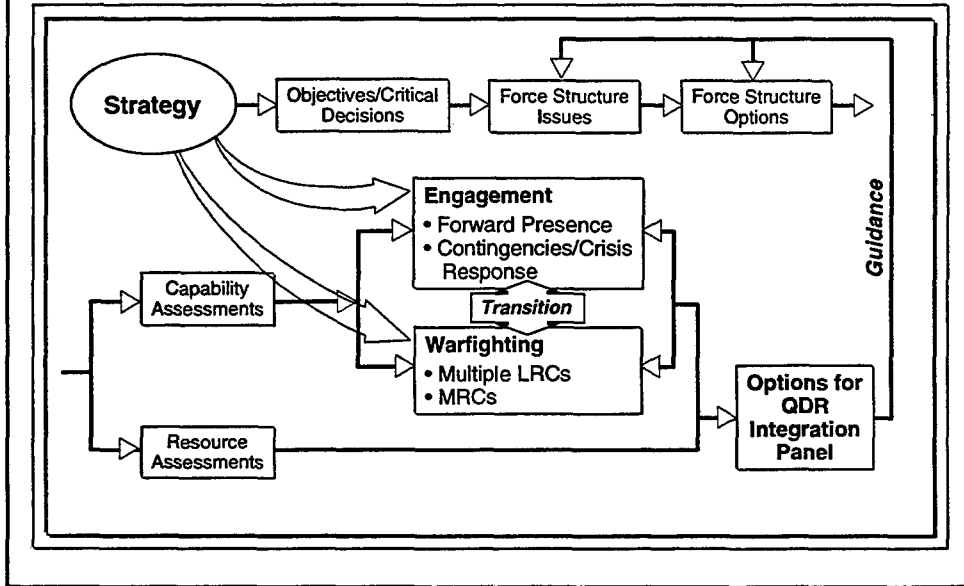
Path 3 – Balance current demands and an uncertain future

- Emphasizes sustaining adequate capabilities to meet near- and mid-term challenges while pressing ahead with measured modernization to meet more challenging future threats
- Accepts moderate risk to meeting the demands of day-to-day operations with somewhat smaller forces

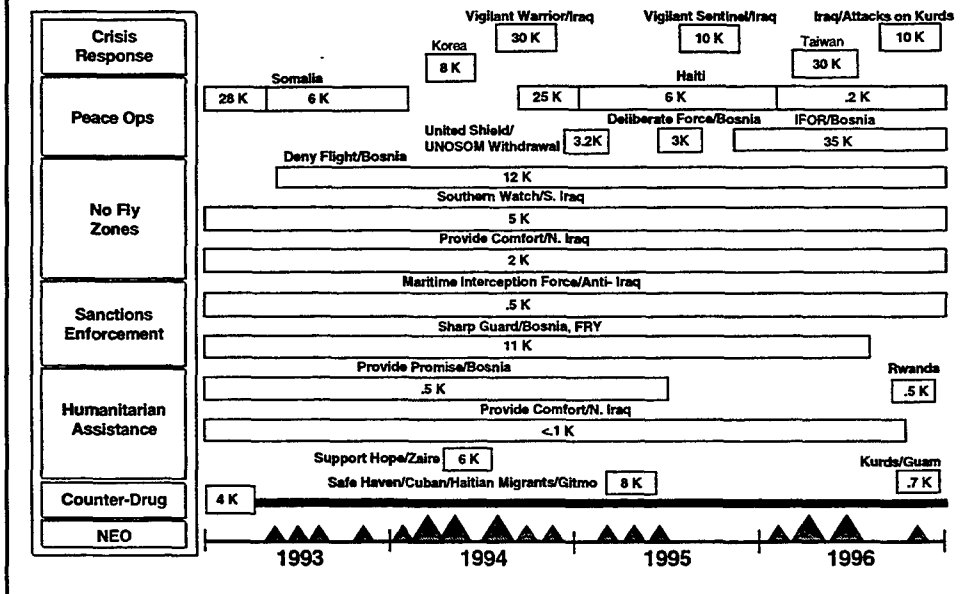
ANALYTIC PROCESS: INVESTMENT COMPARISON



FORCE STRUCTURE ASSESSMENT

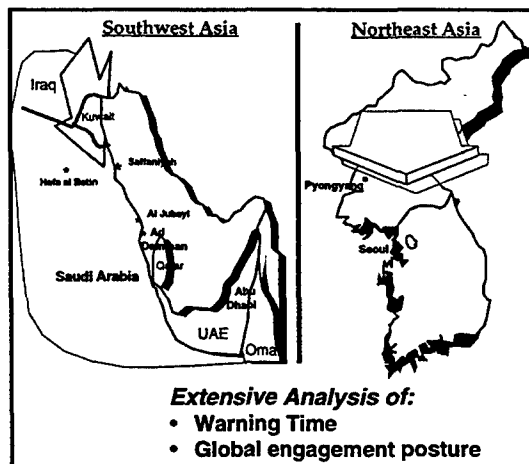


CHANGING NATURE OF MILITARY REQUIREMENTS

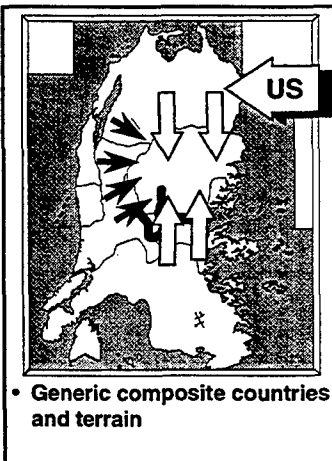


ANALYTIC PROCESS: CAMPAIGN ANALYSIS

Major Theater War 1997-2006



Exploring Generic Conflicts



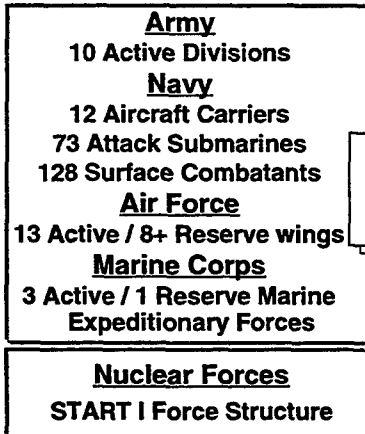
MODERNIZATION INITIATIVES

- Reduce F-22, F/A-18 E/F and JSF buys
- Downsize JSTARS, support NATO AGS effort
- Fully fund (3+3) National Missile Defense
- Accelerate MV-22
- Pull forward Army's Force XXI Digitization
- Expand CW / BW protection

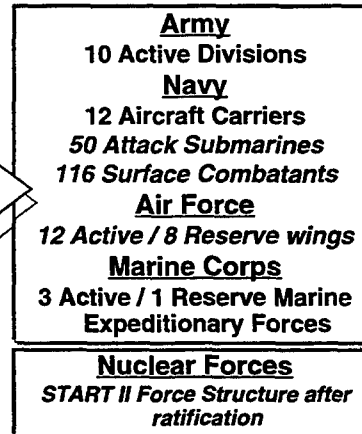
**Secure robust but focused modernization to
implement new vision of future warfare**

FORCE STRUCTURE

Current Force

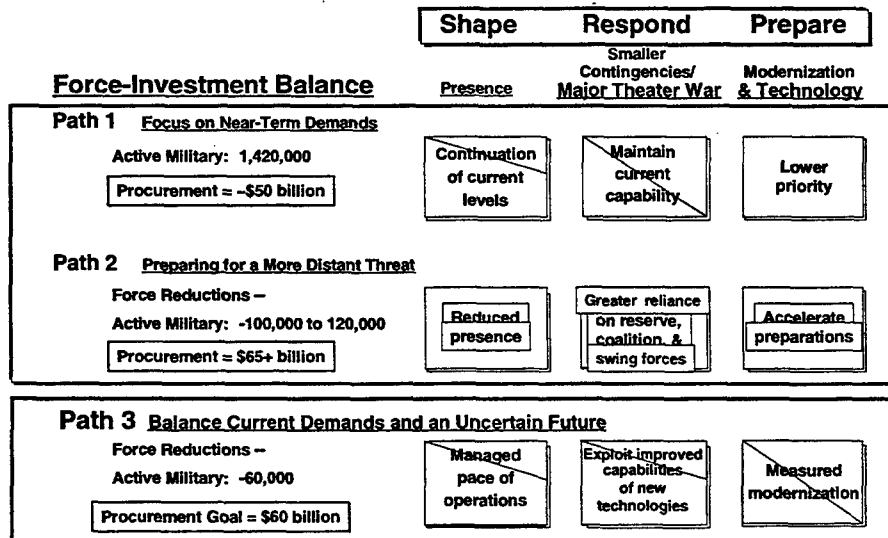


QDR Force



Preserves combat power with a leaner force

STRUCTURING THE REVIEW: INTEGRATED PATHS



3/1/98

**TRANSFORMING DEFENSE
NATIONAL SECURITY IN THE 21ST CENTURY**

**ADM David E. Jeremiah
National Defense Panel**

April 1998

This report reflects active discussion by the panel on overall force-planning concepts, but there was not enough time for adequate review and iteration, given the number of other important items on the agenda. Thus, the correct ideas should be ascribed to the panel; the errors can be ascribed to the chairman.

THE REPORT OF THE NDP

Transforming Defense

*National Security in
the 21st century*

- *The future will be different from today*
- *Significant change is in order and won't be easy*
- *We offer a transformation strategy*
- *More than defense is affected –
The broader national security structure needs to be reviewed*

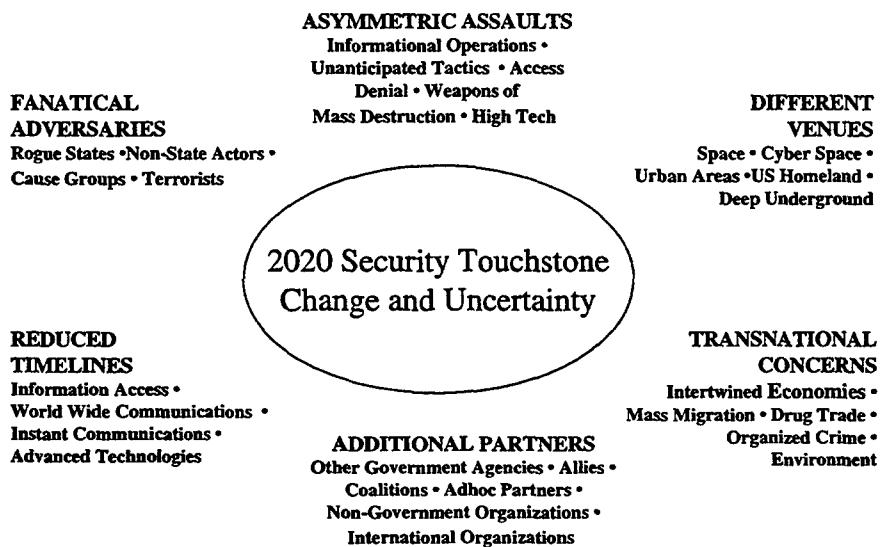


THE NEW WORLD DOD FACES

- **With the end of the Cold War — much of the certainty of defense planning also ended**
- **Today's world and world of 2020 — quite different**
- **Yet, three things are certain:**
 - Threats and challenges will be different
 - No one can predict with any certainty the exact threats, challenges or technology
 - No added funds will be available for DoD — and there may well be less



TOMMOROWS CHALLENGE



THE IMPLICATIONS FOR DOD

- **If you accept this — the implications for Defense are profound**
 - Must undertake to transform forces despite this uncertainty
 - Must test multiple approaches, operational concepts, technology and structures
 - Must be agile and respond as we learn more about the future
- **AND do this with \$250 billion per year (or less)**



CHOOSING WHERE TO TAKE RISK

- **The needed transformation will entail some risks — the real issue is where to take them**
 - Can invest in today's challenges and risk the future
 - Or take near term risks and invest in future capabilities
- **The NDP recommends the second course**
 - Downplay two MTW strategy
 - Cut back legacy systems
 - Reduce forces if necessary
- **Fortunately we are in a period without major threats — thus near term risks are acceptable**



THE FUTURE ADVERSARY...

The Recognized Adversary

- Can field a force
- Will challenge US in the battlespace
- Is an instrument of his nation
- Considers military utility paramount
- Exploits commercial technology
- Buying some modern weapons
- Can challenge our entering forces
- Has WMD in his arsenal
- Will threaten our alliances and coalitions
- Will seek asymmetric advantages



The adversary we understand and have faced...

THE FUTURE ADVERSARY...

Another Portrait

- Has access to technology
- Already has a cell phone
- Lives on the web
- Hides in the city
- Is fanatic about his cause
- Wants to change the US status quo
- Fights an away game
- Does not need "military" success
- Does need headlines
- Won't fight fair
- Will kill innocents
- Fights as cells (not divisions)

★ **NDP** *The emerging adversary we must now address*

RECOMMENDATIONS

New Capabilities to Pursue

- **Space** — opportunities and protection
- **Remote Vehicles** — all mediums
- **Joint Efforts** — especially experiments
- **Homeland Defense** — cyber, WMD
- **Specialized Units** — SSC capabilities
- **Power Projection** — small, networked, agile, lethal, lean
- **Information Ops** — offense/defense
- **National Crisis Center** — integrated

Current Capabilities to Revise

- **Intel** — focus on new challenges
- **Urban Ops** — reemphasize, high priority
- **Power Projection** — from CONUS
- **Commercial Technology** — exploit/transform
- **Info Foundation** — common to Services and Agencies
- **NMD** — retain option (limited attacks)
- **Space** — coordinate military/civil/commercial
- **Info** — timely/accurate dissemination

★ **NDP**

TRANSFORMATION AND RISK

*"The real issue is where we are willing to take risk.
The current posture minimizes near-term risk at a time
when danger is moderate to low
...putting greater risk on our long-term security...
Our priority emphasis (including resources)
must go to the future."*

Report of the National Defense Panel



NDP BOTTOM LINE

- **Focus on future operations**
 - Space, cyberwar, urban, homeland, power projection conditions
- **Address long term opportunities**
 - Information, space, regional partnerships, intell
- **Concentrate on emerging threats**
 - HUMINT, missile defense, WMD, asymmetries, transnational issues
- **Reduce choke hold of cold war legacies**
 - Infrastructure, 2MTW, UCP, national security structure



Fully address challenges of tomorrow, while meeting the needs of today

QDR RESULTS

- **Strategy — tasks - force decision linkage is weak**
- **Was conducted more as DoD bottom-up budget exercise**
 - Not top down
- **Cohen took charge well, but review already underway**
 - Insufficient time for comprehensive review
 - Now actively engaged in follow-on core issues
- **Unable to resolve core issues; all but ignored space, NMD, recognized potential revolutionary impact of new technologies (e.g., UCAV), but no substance**
 - Essentially "kicked the can down the road"
- **Assumed constant defense budget indefinitely into future**

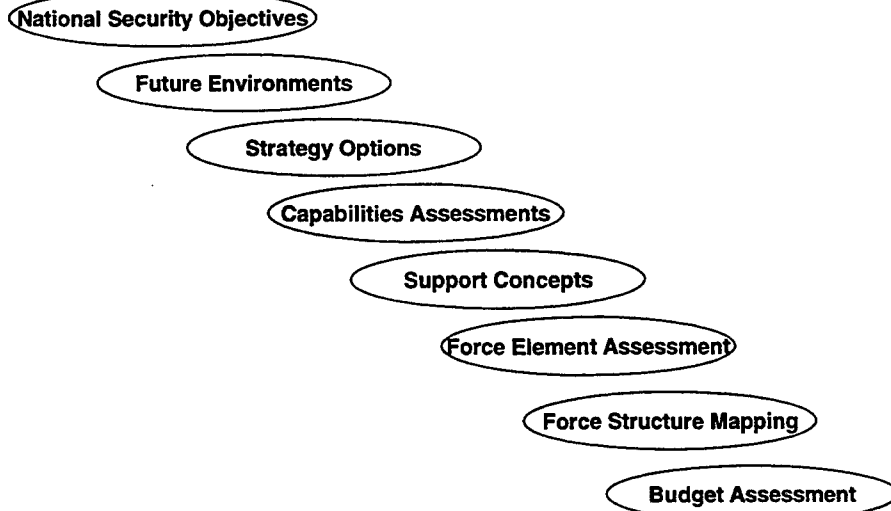
TECHNOLGY Strategies Alliance

NDP REVIEW OF QDR REPORT

- **Panel concerns:**
 - Insufficient connectivity between strategy and force structure on one hand, ops concepts and procurement decisions on the other
 - Important, since QDR addressees an even greater array of challenges than in the past, with even fewer recourses
 - Did not go far enough in revamping military structure
 - Relied too heavily on Cold War models and cases developed with Korea and Persian Gulf scenarios that did not factor in stealthy platforms and high-tech weaponry and sensors
 - Assumed too easily the US's ability to maintain military presence overseas in both Europe and Pacific
 - Skimped on what to do for forces involved in peacekeeping ops

TECHNOLGY Strategies Alliance

NDP ALTERNATIVE FORCE DEVELOPMENT



TECHNOLGY Strategies Alliance

ANALYTICAL TOOLS

TACWAR: NATO/Warsaw Pact force-on-force

Dynamic Commitment: Force availability, no fight

JSIMS/JWARS: High value if they reflect characteristics of future conflicts, future forces

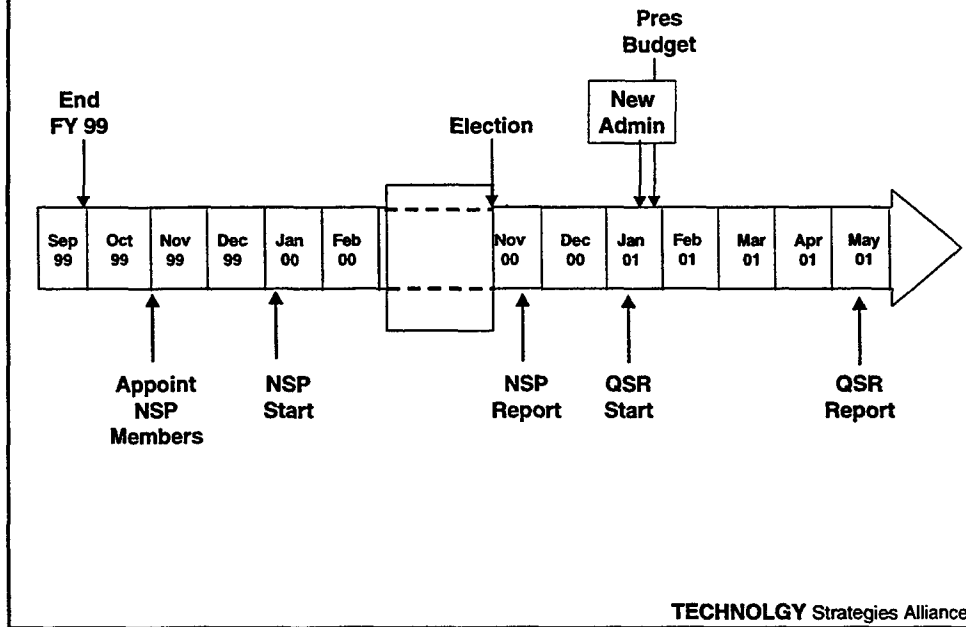
Intelligence: Trade-off between force structure and intelligence systems

Infrastructure: Base closures, accounting systems, logistics

Space, Information Operations, Urban Warfare: ????

TECHNOLGY Strategies Alliance

ALTERNATIVE SCHEDULE



CONGRESSIONAL PERSPECTIVE ON THE QUADRENNIAL DEFENSE REVIEW (QDR)

summary of remarks by

FRANK FINELLI

Legislative Assistant to Senator Dan Coats (R-IN)

Presented at MORS Mini-Symposium, 7 April 1998, Kossiakoff Center

I am delighted to be with you this morning to provide some thoughts about the Quadrennial Defense Review. It is somewhat fitting that MORS has given last billing to the congressional perspective, since we were the ones who were the original troublemakers in legislating the QDR. The message of my remarks this morning — and it is a particularly relevant message to the Military Operation Research Society — is that though we routinely say: "the devils are in the details," in the case of the QDR, it is the Angels who are in the details.

Today, the Congress confronts a military that it does not understand very well. During the Cold War, the mathematics of a threat-based military were easy to comprehend. But today, the combination of increasingly rare military experience in our elected officials, and the transition from a threat-based to a capabilities-based strategy makes it increasingly difficult for the Congress to comprehend broader defense policy. And consequently, the Congress is split in its focus over military priorities. Some look at the present level of operations and concerns over current readiness to advocate a focus on sustaining our present capabilities, while others consider that we are in the midst of a strategic pause. This is not to say that our force is not busy, but that we do not currently confront a global or regional peer competitor who can genuinely threaten our vital interests. This latter group considers that we have a strategic opportunity to invest more heavily in the transformation of our military to deal with the potentially very different threats of the 21st Century

But regardless of perspective, the Congress is convinced of one thing: the need for change, potentially fundamental change, as we transition from the Cold War paradigm. Nonetheless, we all recognize today's dominance of the United States military. I think General Shali said it best in his farewell speech at the National Press club last October.

"Today, our nation has never been more secure. As a matter of fact, today the delta between capabilities of our military forces and the military forces of those who would wish us ill is greater than at any time during my 39 years of service."

And so the challenge for all of us is how to sustain this delta through successor after successor after successor to General Shalikashvili.

It was from this recognized need for change, while at the same time retaining this delta, that the Military Force Structure Review Act of 1996 was sponsored by Senators Coats, Lieberman, McCain, Levin, and Robb. This legislation stated:

"The pace of global change necessitates a new, comprehensive assessment of the defense strategy of the United States and the force structure of the Armed Forces required to meet the threats to the United States in the 21st Century."

The intent of the sponsors was to drive a process of informed debate about the future of defense policy; and to conduct a strategy-based assessment of our military requirements and capabilities, not a budget-driven incremental massage of the status quo. The first step in this process was the Quadrennial Defense Review which we are discussing today. In short, the legislation tasked the Pentagon to do the equivalent of a strategic housecleaning — a comprehensive, no-holds-barred assessment of every facet of our military driven by two fundamental questions. First, in light of geopolitical changes and the potential of technology, what new challenges, threats and opportunities will our armed forces face? Second, how should we organize, equip and size our forces to successfully deal with the broad range of threats they may encounter in the 21st Century?

But realistically the Congress did not think that the Pentagon would be able to fully answer their questions. So they decided to also go "outside the box" to create a group of distinguished independent military analysts to conduct a study in parallel with the in-house QDR effort. As ADM Jeremiah just discussed, this National Defense Panel was to consider alternatives unencumbered by Pentagon policies, Congressional constituencies or budget constraints. The NDP report is the 2nd step in this process and it provides an alternative view, not based on distrust or suspicion of the Pentagon, but on the recognition that we need bold and innovative thinking from a variety of sources in this time of rapid change. As such, this NDP served two vital functions: as a hedge against the status quo and as an independent validation of innovative recommendations proposed by the QDR. On balance, we believe the Panel has produced a very useful alternative view that has sharpened the debate. And I think it is important to acknowledge up front that the Congress views the QDR through the lens of the NDP.

As I comment on the QDR, I will focus on areas of contention and those in need of further analytical refinement with respect to the force assessment, while merely acknowledging several of the key QDR contributions. So this morning with your indulgence, I would like to address three aspects of the QDR: its strategic assessment; the resulting budget; and some issues in need of further assessment.

STRATEGIC ASSESSMENT

I want to point out several of the QDR's significant steps forward. First, even before it was released, the Quadrennial Defense Review achieved an important part of the Congress's goal by catalyzing a broad and vigorous debate within the Pentagon which engaged more people who considered more options than either of the previous two post-

cold-war security assessments. Second, the QDR developed a much more comprehensive view of our future strategic environment than we had from previous studies. It describes the way in which U.S. national security will be affected by unconventional threats including terrorism, or chemical and biological warfare; but also included the capacity of an enemy to strike at us in asymmetrical ways, that is to find U.S. vulnerabilities and develop the capabilities to exploit them. We see this in areas of force projection, information operations and weapons of mass destruction. And third, the QDR assessed our force requirements from the perspective of the full spectrum of operations. In so doing, the QDR credibly recommends the United States maintain the military capability to either fight and win two overlapping major theater wars from a posture of engagement; or to sustain peacetime engagement; whichever is greater.

SHAPE and RESPOND

The Shape, Respond, Prepare Now strategy adopted by the QDR is a credible representation of our military requirements. And we should recognize one of the great accomplishments of the QDR to be the development of some very innovative assessment tools to deal with our Shape and Respond tasks, those being the Baseline Engagement Force and Dynamic Commitment. And it was through these assessment tools that the QDR recognized that the capability required to sustain peacetime engagement is the sizing mechanism for far more than naval carrier and amphibious groups, such as many Army and Air Force capabilities as well.

However, we must acknowledge a shortfall in our Shape and Respond activities. The legislation specifically tasked the QDR to analyze the effect on the force of preparation for and participation in peace operations and operations other than war. And I don't think we have a satisfactory answer for this task yet.

Deployment figures from testimony this year indicate that approximately 15,000 Air Force and 40,000 Army are committed to current operations. These levels are respectively less than 3% and 4% of their total endstrength. Yet, we get the impression in open press and congressional visits to the field that this level of PERSTEMPO and OPTEMPO is breaking the force. Why is this relatively low level of commitment causing such turbulence? Private sector corporations routinely deal with disruption of this magnitude. What are we failing to do? Either we are missing a piece of the assessment, or we are not effectively managing these levels of peacetime engagement. It appears that the Services are not evolving their force structures to adequately meet the QDR strategy. So it should not be a surprise to the military when congressional leaders balk at their requests for endstrength reductions, because at the same time we are receiving testimony about shortfalls in unit manning and prolific cross-decking practices.

At the higher end of the operational spectrum, the QDR does undertake an assessment of two overlapping major theater wars, from posture of engagement. And it assesses some weapons of mass destruction effects. But it does so largely using the same piston-driven, attrition-based methodology of the Bottom-Up Review. Yet, how does the

existence of Joint Vision 2010 change the operational or tactical plan for the warfight, and how have we incorporated that change in our assessments? Does Joint Vision 2010 make it difference? If so, then how do our models reflect it?

Regardless of these shortfalls, the QDR's work in defining the Shape and Respond aspects of the strategy represents great progress and a necessary step in maturing from an attrition-based Cold War strategy to a full spectrum strategy for the 21st Century.

PREPARE NOW

The real issue of Congressional contention with the QDR deals with the strategic pillar of Prepare Now. What credible methodology was employed in the QDR to assess Prepare Now requirements? We don't know, what we don't know about how the integration of advanced technologies with changes in organizational structure and operational concepts will enhance our joint warfighting capabilities. And we don't know how a thinking enemy will identify, attack, and exploit our vulnerabilities; and what our response will be to these asymmetric approaches. This is one of the reasons there has been such a push for joint experimentation.

The Congress acknowledges the QDR did reduce the planned quantities of some weapons systems; but is concerned that no major programs were canceled. Perhaps even more important as we look forward, the QDR recommended no new programs to deal with the extraordinary range of threats described in the strategic review. The explosion in technology could literally drive discontinuous change in the way enemies will fight; while at the same time creating enormous opportunities for us to fundamentally improve our military capability, and perhaps in a much more cost-effective way.

The QDR concluded, in essence, that we can Prepare Now for the Future by stabilizing the planned procurement profile and retaining the existing force structure. As such, the QDR is a plan of incremental change.

On the other hand, the NDP makes a compelling argument that fundamental, not incremental, change is essential. They question the course of existing policy and recommend, instead, that we develop and pursue with priority, a policy to transform today's post-Cold War force to tomorrow's information age force. The Panel viewed new operational challenges in areas such as power projection, space and weapons of mass destruction, that, when juxtaposed with opportunities driven largely by the revolution in information technology, could be so extraordinary they could totally change the way antagonists will fight us, and the way we would chose to fight them. Furthermore, the NDP concluded we face greater risk in the future than we face today due to the nature, magnitude and trend of these operational challenges.

Consequently the NDP recommends we reconsider decisions that commit enormous national resources toward forces and platforms which may be less relevant in the future. Perhaps our future force should be thought of in different terms than Army

divisions, air wings and naval carrier groups. Some of the force options Dr. Mike Gilmore just addressed may represent some of the alternatives which should have been considered. Whereas the QDR assessed major theater warfare in terms of the last war, the NDP took an entirely different approach and developed a template of critical force characteristics that should serve as a foundation for assessing our defense programs and prioritizing joint requirements. Recent events in Southwest Asia seem to validate the Panel's conclusion. Our apparent difficulty to gain access for land-based aircraft to strike Iraqi targets suggests important limitations in the capabilities of our existing and planned force. And yet, the Pentagon continues to pursue over \$300 billion in procurement for short-range tactical fighters which have already proven to be of questionable relevance.

JOINTNESS

There is also some disappointment that the QDR report did not deal with the further implementation of the Goldwater-Nichols legislation, which has not fully achieved its goals for jointness. Last October, we celebrated the 10th Anniversary of Goldwater Nichols. And though joint doctrine, training and education have improved, we still do not have a joint force. In fact, the only level of jointness in our military is routinely at the 4 star CINC level. Why didn't the QDR investigate joint force options as part of its alternative force structures; instead focusing on the 10% and 20% fixed decrements?

The QDR introduces some of the service initiatives directed at preparing our force for the 21st Century. These initiatives are loosely associated with implementing Joint Vision 2010. Yet the NDP recommended we must jointly experiment to investigate the potential of a new, perhaps completely different, force. In their comment on the QDR last May, the NDP stated that "added effort is needed to encourage further development of joint and combined operational concepts." And last December's Report of the NDP is even more blunt in recommending that jointness be brought back to the forefront. "At the core of this [transformation strategy] should be a much greater emphasis on jointness." The Congress largely agrees with this joint thrust and some members are currently working to establish and resource an overarching process of joint experimentation charged to investigate what will and what will not work on future battlefields, as we integrate advanced technologies with changes in organizational structure and Operational concepts.

In his National Press Club speech mentioned earlier, General Shali also cautioned us about commitment to jointness.

"We shouldn't believe that all of our gains in jointness are chiseled in stone and that the path ahead is clear. There are still strident voices for parochialism who would like to slow the progress of jointness in the force and even those who want to turn back the clock to 1985. . . . We must not allow that to happen. Future warfare in all of its varieties will be joint warfare, and that simple fact must continue to guide the development of our armed forces in the future."

One way to ensure we don't turn back the clock on jointness is to approach our analysis from a fully joint perspective. Yet, that isn't going to happen as long as the Services control the vast majority of the analytical resources and contract money. Just look at the agenda for this MORS conference where this afternoon's schedule is service presentations: Army, Air Force, Navy and Marine corps briefings. Why aren't we considering presentations based on joint capabilities? The fact is, too much of what happens in the Pentagon and our military still happen in the stovepipes of the four services. Yet, technology has enabled the capabilities of every service to invade each other's traditional domain. We do not see enough cooperation across service lines, we don't see proponency and priority for the development of joint enablers in term of C4, ISR, TMD, logistics, etc. And we also do not see prudent emphasis on joint opportunities to either achieve efficiencies or increase our warfighting effectiveness.

So overall, the QDR provides great innovation as the first step in full spectrum strategic assessment for the 21st Century. It has its shortcomings. And we can only hope that the Pentagon and organizations such as MORS will work to fix them.

QDR PLAN - BUDGET MATCH

The QDR legislation very deliberately failed to provide a budget constraint. The Congress did not legislate the QDR as a way to cut the defense budget. That might have been the result, but many members thought a future-oriented review might just as logically lead to an increase in the defense budget, and if so, then they expected the Secretary of Defense to recommend such a budget. In fact as you look at the QDR's more comprehensive strategy, it argues for additional budget unless we can effectively reengineer our defense infrastructure.

But as we all know, the QDR contains no such recommendation. Yet as evidenced by the growing bow wave in defense procurement either one of two things, or both is occurring. Either we really do need a higher defense budget, or we have a crisis in joint requirements.

There is little doubt that the QDR provided a better balanced defense budget. But the budget is short. From the perspective of Congress, it appears the objective of the QDR was to stabilize the level of planned procurement across the FYDP, thereby getting us to the \$60 billion level by 2001. Many applaud the QDR's 140k reduction across active, reserve and civilian endstrength. It serves as an ingenious way to get at the tail, while preserving the tooth. Yet, Congress is somewhat skeptical because these reductions appear too symmetric. They look like a bureaucratic compromise rather than the conclusion of a strategy-based assessment.

We do see a rise in procurement from FY98 to FY99; yet, the level of planned procurement across the FY99-03 FYDP is \$16 billion less than programmed in the PY98 POM based on the QDR. And this level of procurement would have been even lower if

the Congress had authorized BRAC. At the same time, Operations and Maintenance funding has increased \$25 billion across the FYDP. Therefore, the bottom line is that the QDR did not totally fix our O&M shortfall.

So either we really do need a larger defense budget, or we need to introduce more scrutiny in the employment of our forces, operation of our infrastructure and prioritization of our joint requirements. The FY99 budget indicates that we may have turned the corner in procurement, but the question that remains is not about the replacement of legacy systems, it is about the recapitalization of our joint capabilities to wage information-age warfare, and deter and defeat conventional and asymmetric threats to our national interests in the 21st Century. In short, we have a pronounced shortfall in investment directed at broader transformation activities. This includes a vigorous process of joint experimentation and the development of a culture of innovation that today, simply does not exist. The NDP indicated a transformation wedge of \$5-\$10 billion is required, and that this is so important that the DoD should reduce force structure and scale back procurement if it cannot be funded through infrastructure efficiencies.

The Congressional Budget Office estimates that we have a sizable plans and funding mismatch. They believe this mismatch could be on the order of 4% across the FYDP, approximately \$10 billion per year. And based on the plus-up requests we have received from the Service Chiefs and the member lists of broken programs across the defense industrial base, I think these shortfall estimates are largely valid. I think the bow wave is important for at least two reasons: it either dampens the pace at which we can introduce advanced technologies into the fleet as we decrease production to uneconomic rates and stretch out programs; or it postpones programs to the point of capability obsolescence due to the rapid pace of technological change.

Why do we have a bow-wave? Many congressional members believe it is due to a crisis in requirements whereby each of the Services is planning to replace their legacy systems on nearly a one-for-one basis, without recognizing the capabilities other services bring to the joint warfight. For example, the Pentagon is currently planning to procure over 4000 advanced tactical fighters, each of which are reported to be two to six times more effective than today's F14, F15, F16 and F/A18-C/D. We are also pursuing over 2000 advanced Attack and Armed Reconnaissance Helicopters; yet consider the capability differential of Comanche versus the Kiowa Warrior. And on top of this there are thousands upon thousands of new long range PGMs and Missile Systems. As if this were not enough, we have additional testimony of M1A2 being two times more effective than M1; yet we will buy over 1000 of them; and Crusader being three times more effective than the Paladin; yet we plan to buy nearly 900 of them. We have similar examples for the Marine Corps' AAV, V22; and the list goes on and on.

In short, we are planning to field a far more combat effective conventional military. And we are planning to do this at a time when the military capability of most potential adversaries is in decline. What is it about emerging threats that drives an aggregate requirement for increasing conventional capability? As it is, U.S. defense

spending exceeds that of the next 10 nations in the world combined, and most of those nations are our allies or potential coalition partners. Furthermore, if there is one thing we probably know from the experience of the early 1990's, it is that no nation for the foreseeable future will put 1000 advanced tanks on the ground or 1000 advanced attack aircraft in the skies against the United States military. So from the perspective of Congress there is skepticism that we need all this hardware; and perhaps more importantly, there is an increasingly widespread view that we may be investing in the wrong capabilities.

The real growth in requirements most probably deals with combating the asymmetric capabilities associated with operational challenges highlighted by the National Defense Panel — power projection, urban operations, information operations, etc. But that is not where we are placing our effort.

If the QDR was fully successful, there should be no bow-wave. But, in short, a successful QDR would have conducted the joint analysis sufficient to rationalize and prioritize our joint requirements and determine the corresponding defense budget. This implies that tough decisions must be made, winners and losers must be chosen and money will have to move across the defense program. To date, there does not appear to be the bureaucratic will to make these changes in the Pentagon, or the political will to force them from Capitol Hill.

So in the final analysis, the QDR results in a far more balanced defense program. Yet it leaves us with a bow wave in procurement and no transformation wedge.

TASKS LEFT UNADDRESSED

The Military Force Structure Review Act of 1996 laid out twelve specific tasks for the QDR. Of these specific tasks, at least three remain largely unaddressed. And I would challenge MORS to focus on these issues as we look toward the QDR and NDP of 2000.

The first task deals with the anticipated roles and missions of the reserve components in the defense strategy and the strength, capabilities and equipment necessary to assure that the reserve components can capably discharge those roles and missions. But instead we have a credible QDR recommendation to prudently reduce Guard combat structure, and the complete bureaucratic failure of the Total Army to implement it. Instead, we are left with a Guard Division Redesign effort that retains in excess of six combat divisions as a strategic reserve. Reserve for what? While the NDP has provided some very credible thoughts about the Guard's role in homeland defense, it may require a very different force structure than that of the division-based strategic reserve. This is a problem in need of fixing, and it is bigger than an Army issue. Rather, the reengineering of the National Guard is an issue requiring the direct involvement and commitment of the DoD civilian leadership, the Governors and the uniformed leaders of the Total Army.

The second task deals with the Airlift and Sealift capabilities required to support the defense strategy. This task is not about quantity, it is about the quality of capability. The question is not whether we have the right number of LMSRs, it is the far more fundamental question of whether or not the LMSR provides the required capability to project force via sealift given the anti-access capabilities adversaries may employ. If we cannot secure fixed modern ports, then we will need far more than LMSR's to project ground force. We may actually need a sealift over-the-shore capability or else heavy Army divisions may become strategically irrelevant. True, we need to revisit MRS-BURU given precision munitions, smaller divisions, less logistics, etc. But perhaps more importantly, we need to assess the requirement for power projection in dealing with the asymmetric anti-access threats so eloquently described by the National Defense Panel.

The third task relates to the effect on the force structure of utilizing technologies anticipated to be available by 2005 including precision guided munitions, stealth, night vision, digitization, communications and the changes in the doctrine and operational concepts that would result from the utilization of such technologies. It is a shortcoming of the QDR that it did not address alternative organizations for landpower, airpower and seapower. Rather it left us with the same service stovepipe organizations; Army division, Air Wing, Naval Carrier Battle Group and Marine Expeditionary Force. When the legislation addressed alternative force structures, it did not strictly imply different numbers of divisions, wings or carrier groups. Rather, it was intended to drive at best a plan for, and at worst a recognition that the organization for future warfighting may be in entirely different terms.

The QDR report states that our future forces will be different in character. But how? The QDR makes only minor changes to the size of our force, and makes no mention of changes to the organization of our current force, such as a vanguard force or standing JTF. These are the alternatives Congress is looking for. No one says we should implement fundamental organizational changes now. But even with one year under our belts with the QDR's Shape, Respond, Prepare Now strategy, we still have not even postulated any alternatives to jointly experiment with.

So I see at least two future challenges for MORS as it relates to this task:

- Conduct an analysis of JV2010. How do you model and jointly experiment with dominant maneuver, precision engagement, full-dimensional protection, and focused logistics in such a way that you can start to gain insights about technological requirements and the changes which these concepts should drive in organizational structures, doctrine and tactics.
- Develop truly alternative force structures. How do we change our force structure to solve PERSTEMPO turbulence and deal with 21st Century operational challenges in power projection, force protection, information operations and urban warfare?

CONCLUSION

The Congress did not legislate the QDR to reduce the defense budget. Their intent was to drive a strategy-based assessment of our military requirements and capabilities far out into the future. When viewed from the lens of the NDP, the QDR opts for a strategy that focuses on near-term and familiar challenges, when perhaps it should more appropriately pursue a transformation strategy focused on the very different, and potentially far more serious challenges likely to be faced over the longer term.

The United States and our coalition partners shared a stunning victory in operation Desert Storm. Yet for us now to rest on that success and indicate we are not willing to make major changes, may condemn us to the lessons of history. We cannot simply strengthen and retain the capabilities of our last success. Rather, we must fully understand and prepare for the potential of our next war. That is going to take some bold thinking.

Some will say: "QDR says it all, we're doing well, our security is clear. If it ain't broke, don't fix it." Of course, we agree our security is strong and it ain't broke today. But if we don't start to transform our military to address the operational challenges of the 21st Century, we could find the value of our capabilities has greatly depreciated in 10-20 years hence. Then, we will not have fulfilled the measure of our responsibility under the Constitution to provide for and protect the common defense today, and into the future. This requires stepping outside the box to challenge current assumptions and the status quo as we look to the future. We must start this process in earnest.

This call for change goes not just to the Pentagon, but also to the Congress because the decisions we are making today will commit enormous national resources and determine the military forces we will have for decades. The real concern is that if we stay locked into a posture that closely resembles the current state of military affairs, our decisions will preclude us from having the resources and flexibility to make different decisions or to address different threats in the future. It is for this very reason I think the NDP recommended the defense transformation be funded as a priority.

So in closing, we need to ensure the QDR is the beginning and not the end of a process. We need to look to outside sources like the National Defense Panel and MORS to give us guidance in terms of what the proper questions are and what decisions must be made. I challenge you to be the Angels in the details of shedding our Cold War attrition-based pathologies, and developing the new and relevant methodologies needed to assess our capabilities against today's threats, as well as the asymmetric developments of the future. Only then will we be able to push against today's status quo and develop the joint warfighting capabilities needed to assure full spectrum dominance well into the 21st Century.

SERVICE PRESENTATIONS

ARMY:

Dr. Robin Buckelew, Director Army Center for Land Warfare

NAVY:

VADM Conrad C. Lautenbacher, Jr., Deputy Chief of Naval Operations (Resources, Warfare Requirements and Assessments)

AIR FORCE:

MajGen Donald L. Peterson, Assistant Deputy Chief of Staff for Air and Space Operations

MARINES:

LtGen Martin R. Steele, Deputy Chief of Staff for Plans, Policies and Operations

ARMY PLAN FOR THE ROAD TO QDR 2000

Robin Buckelew




**Editors Note: This Presentation Was Retyped By the MORS Office.
Some Of The Art Clips In The Original Presentation Were
Not Available And Are Omitted From This Version.**

PURPOSE:




**To outline an Army plan to
prepare the Army for QDR 2000**

LOOKING BACK AT THE QDR

Three Positives

- | | | | |
|---------------------------------|---|---|---|
| STRATEGY BASED FORCE | ← |  | Analysis of CINC's requirements
vs
OSD 10-20-30% reductions |
| SIZE THE FORCE | ← |  | MTOF process/Dynamic Commitment |
| STAFF EDUCATION/
INTEGRATION | ← |  | Vignette design and analysis/
commitment of quality people |

Three Negatives

- | | | | |
|------------|---|---|--|
| ANALYTICS | ← |  | Absence of disciplined foundation |
| DATABASES | ← |  | Nonexistence/nonavailability/
lack of access |
| TIMELINESS | ← |  | Late start/initial stovepipe focus/
undefined staff integration process |

QDR 1996 LESSONS LEARNED



STRATEGY WAS CRITICAL

- **DCSOPS/AVCSA role in establishing strategy was successful**
- **Strategy - Shape Respond Prepare - reinforced land force requirements**
- **Strategy defined the Army position in QDR process**
- **CLW/CAA analysis of CINC's warplans reinforced land-force requirements**

CRITICAL TO LAND FORCE REQUIREMENT



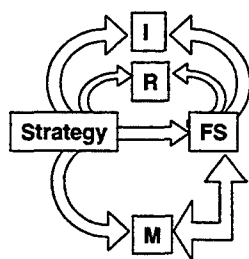
MISSION TASKED ORGANIZED FORCE STRUCTURE

- **DCSOPS used MTOF as force builder tool**
 - **Engaged MACOM(s) early in MTOF process**
 - **Engaged CINC(s) early in MTOF process**
- **Ensured success in Dynamic Commitment wargame**
- **Became catalyst for capability based threat adaptive concept**

THE MTOF IS A LOGIC-BASED DEFENSIBLE FORCE STRUCTURE TOOL

THE CLW VIGNETTE PROCESS...

- Provided a framework for development of alternatives
- Linked strategy to resources
- Provided risk assessment as integral part of process
- Identified puts and takes
- Established full Army Staff participation
- Became staff integration mechanism
- Including AVCSA(CLW), DCSOPS, DCSLOG ACSIM, DCSPER, DPAE



STRATEGY IS THE DRIVER

STRATEGY

- Drives Force Structure Cost
- Drives Modernization Cost
- Drives Readiness Cost
- Can Drive Infrastructure Cost
 - Forward Basing
 - Force Projection

FORCE STRUCTURE

- Drives Readiness Cost
- Drives Modernization Cost
- Drives Infrastructure Cost

MODERNIZATION

- Affects Cost of Force Structure e.g. Combat Multipliers
- Force Capability Drives Infrastructure and Readiness Cost
 - Fielding
 - Support

BALANCING ARMY FORCE STRUCTURE, MODERNIZATION, READINESS AND INFRASTRUCTURE

DEFICIENCIES IN ANALYTICS

- No modeling architecture
- No theater level analytical model capable of addressing issues with required fidelity
- No models for asymmetric threats
- No models for non-force-on-force SSCs

JOINT MODELING: A MAJOR DEFICIENCY

EXISTENCE AND AVAILABILITY OF DATABASES

- **Lack of database to quantify migration of readiness money to base support**
- **Lack of database to assess warfighting casualties**
- **Lack of database on utilization of Reserve Component**
- **Lack of centralized database on utilization of Army forces in previous missions**

EXISTENCE AND ACCESS TO DATABASE IS CRITICAL

LATE START

- **Failure to engage in process early**
- **Internal stovepipe processes**
- **Undefined staff integration process**
- **No organization responsible to coordinate effort**
- **Army effort: ad hoc**

TIMELY ORGANIZATION IS CRITICAL

PLAN FOR QDR 2000

Initial steps: institutionalize QDR lessons learned and address deficiencies



Lessons Learned

QDR 2000

IDENTIFY CONTINUUM OF CAPABILITIES ARMY MUST BE PREPARED TO DELIVER

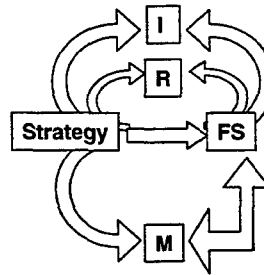
- Review capabilities determination process
- Further develop strategic capabilities matrix from strategy to mission to capability to DTLOMS

Strategy → Mission → Capability → POM

PROVIDE INTEGRATION TOOL TO DEVELOP INVESTMENT OPTIONS

Institutionalize vignette process to establish a common understanding of the POM investment impacts on various strategies

- Force Structure
- Readiness
- Infrastructure
- Modernization



STRATEGY IS THE DRIVER

VALIDATE ARMY'S FORCE SIZING MECHANISM

- Further develop MTOF concept and implement in TAA 07
- Integrate capabilities determination process with MTOF sizing methodology

**IDENTIFY ANALYTIC TOOLS TO ADDRESS
REQUIREMENTS FOR ANALYTICAL MODELS TO
SUPPORT MAJOR REVIEWS**

Existing Models

Future Models

Army: JANUS, CEM

WarSim

Joint: EADTB, EADSim, JICM, TACWAR JWARS, Jsims

- **If we do nothing, we will have only existing models, none of which treat the theater with sufficient fidelity.**
- **With more funding, we could have ARES, an Army model with fidelity for joint operations. Even with funding, other theater models cannot be available.**

**DATABASES WITH CREDIBLE DEPTH/BREADTH
TO SUPPORT ANALYTIC MODEL
IMPLEMENTATION**

- **Casualty database**
- **Army flow model**
- **Probe database**
- **Vignette results**
- **Objective Force Planning database**

EARLY ORGANIZATION IS ESSENTIAL

INTEGRATE STAFF INVOLVEMENT EARLY IN OSD AND JOINT STAFF ACTIONS

- **Joint strategy review**
- **National security strategy**
- **National military strategy**
- **Other activities setting the stage for the QDR**

PLAN FOR SUCCESS

THE FUTURE IS NOW

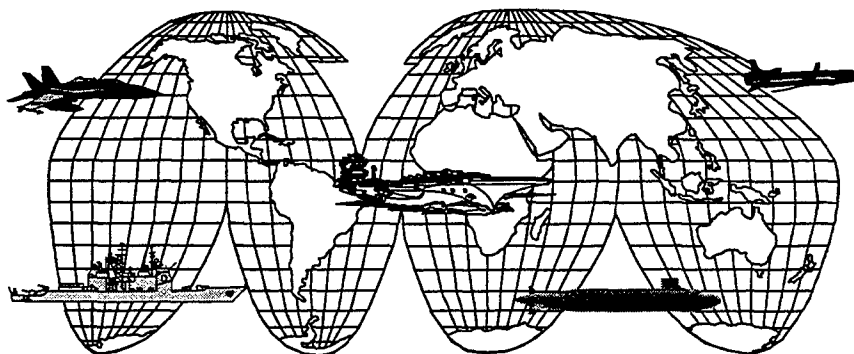
**WE ARE MOVING ALONG AN INTEGRATED
SYNERGISTIC PATH TO QDR 2000**

ACTIVITIES ALONG THE WAY

- **Conduct analytical studies relating to resource issues**
- **Develop strategic capabilities matrix--Strategy to POM linkage**
- **Conduct long-term casualty analysis**
- **Conduct studies for analysis/visualization**
- **Analyze AWE vignettes**



QUADRENNIAL DEFENSE REVIEWS



1997 and 2001

VADM C. C. LAUTENBACHER
DEPUTY CHIEF OF NAVAL OPERATIONS
RESOURCES, WARFARE REQUIREMENTS AND ASSESSMENTS



OUTLINE

- **Last QDR**
 - Strategy and Dilemma: Modernization vs. O&S
 - Navy Approach
- **Implementation**
 - Marrying strategy and program
 - Transforming platforms to revolutionary capabilities
- **Preparing now for the next QDR**
 - Issues, scenarios
 - Tools



STRATEGIC UNDERPINNINGS

- **The United States will:**
 - Retain an influential voice in international affairs.
 - Continue to pursue a strategy of engagement.
 - Continue to exert global leadership.
- **This requires:**
 - Ready and versatile armed forces capable of successfully executing a wide range of concurrent military activities and operations worldwide.
 - Willingness to employ military power to promote and defend national and common interests.



ELEMENTS OF SECDEF'S STRATEGY

- **SHAPE** the international environment
- **RESPOND** to the full spectrum of crises
- **PREPARE NOW** for an uncertain future



THE QDR DILEMMA

- **How do we**
 1. Stay forward engaged, respond to crises
 2. Remain prepared to handle two major theater wars, and
 3. Maintain credible strategic deterrence
- **And still modernize at a rate sufficient to maintain necessary force levels?**



PROTECTING MODERNIZATION

- **QDR intended to be “a strategy-based review.”**
- **Spent significant time addressing the migration of modernization funds to operations and support accounts.**
- **DoD identified potential risks:**
 - *Unprogramed operating expenses* (contingencies, depot maintenance, real property maintenance, milcon, medical care).
 - *Unrealized savings* (outsourcing, business process reengineering)
 - *DEMANDS not currently programmed* (NMD, START I, NATO enlargement)



NAVY'S APPROACH TO QDR

- **No reinvention required — *We have the right vision and strategy.***
- **Highlight naval strengths:**
 - Increasing utility of maritime forces in an uncertain future.
 - Relevance of naval forces to Joint Vision 2010.
 - Exerting influence from the sea — free of access constraints.
 - Providing national leaders with the tools to do the job — whenever and wherever needed.



NAVY QDR RESULTS

- Forward presence validated under new concept of "SHAPE."
- Reaffirmed 12 CVBGs and 12 ARGs
- F/A-18E/F program sustained
- Early DECOM OF 15 surface combatants, two SSNS, one submarine tender
- Personnel reductions: -18K Active, -4.1K Reserve, -8.4K civilians
- Total savings: \$1.6 Billion to \$1.7 Billion

Viewed as a success



QDR ANALYSIS

- **Campaign Analysis/2 MTW Scenario**
 - Focused heavily on Air-Land Battle (JICM/TACWAR)
 - Inadequately account for contributions of Maritime forces
 - Does not fully capture real world events and operations that stress Maritime forces
- **Naval Services' arguments for presence**
 - Validated by real world events
 - Taiwan Straits/Desert Strike
 - Recent events in Persian Gulf
 - Quantitative analysis difficult



A PLAN FOR THE FUTURE

CONCEPTS

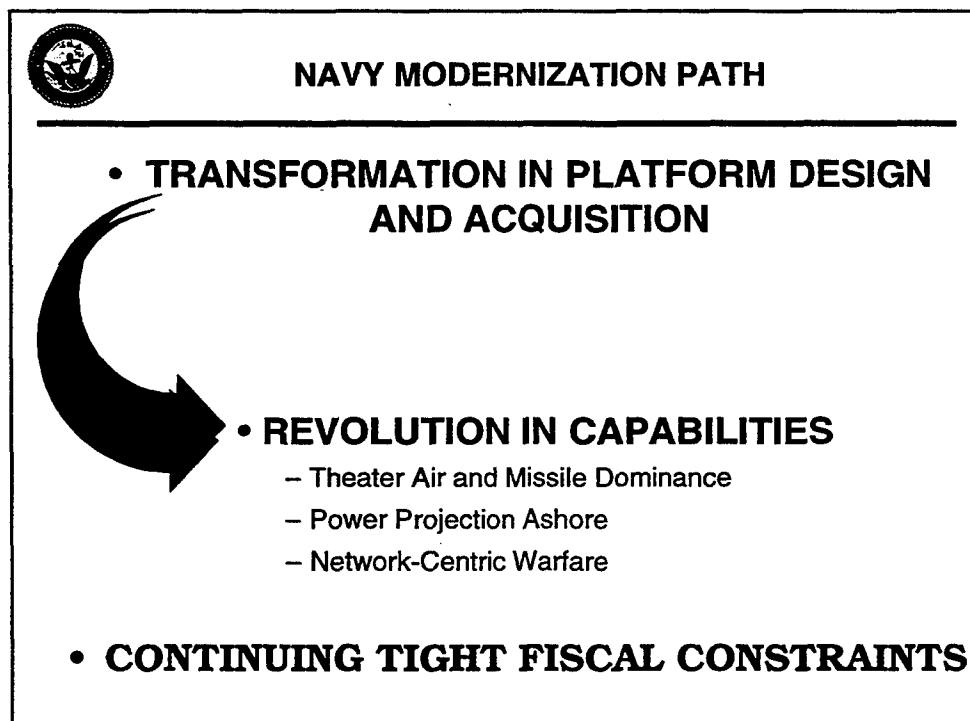
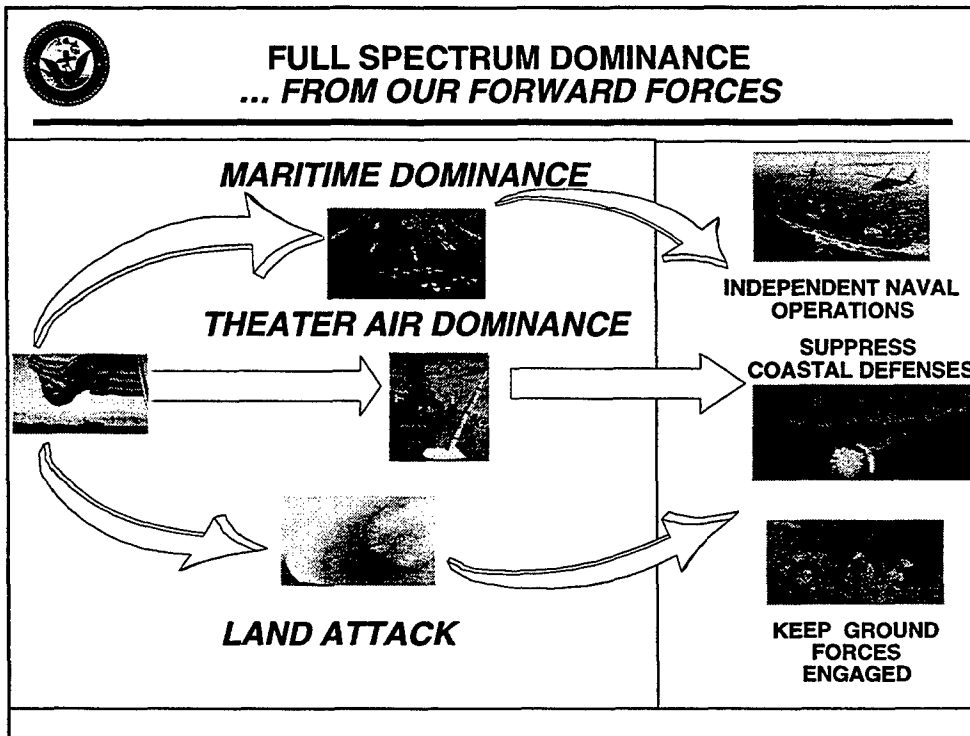
QDR... and NDP
Forward... From the Sea
Navy Operational Concept
Joint Vision 2010
Operational Maneuver from the Sea
Network-Centric Warfare
Navy Long Range Planning Objective

Land Attack Systems
Cooperative Engagement Capability
Information Technology 21
Joint Strike Fighter
Unmanned Vehicles
Missile Defense

PROGRAMS

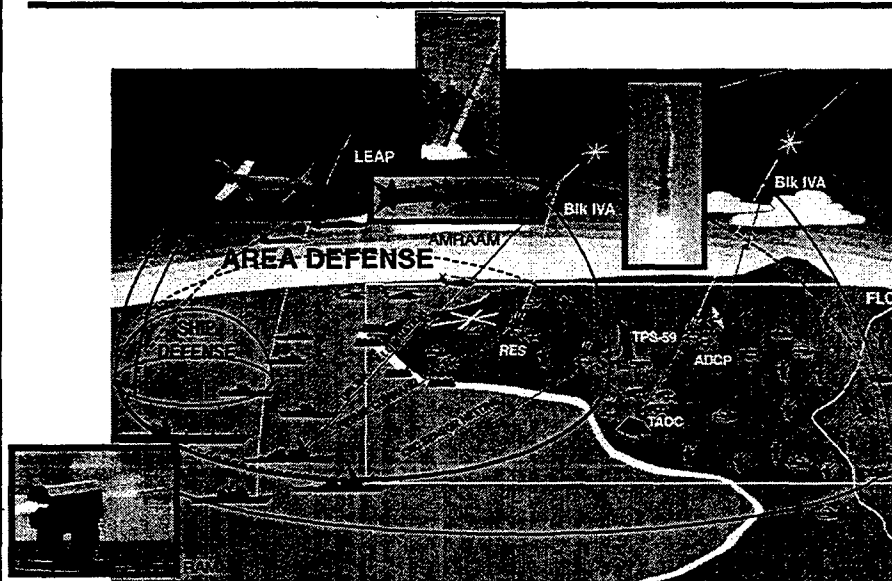
**NAVAL FORCES EQUIPPED
FOR FULL SPECTRUM
DOMINANCE WHENEVER
AND WHEREVER NEEDED**

**JOINT
TASK FORCE
COMMANDER**





THEATER AIR DOMINANCE

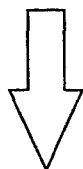


POWER PROJECTION ASHORE

Decisive Targeting

Decisive impact from on-scene forces:

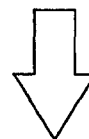
- Nodal targeting
- Networked speed of command
- Massing fires, not forces



**"Classic" targeting methods
(1/3 or more of total)**

**Strike only a few of total
...but the ones that count, when they count**

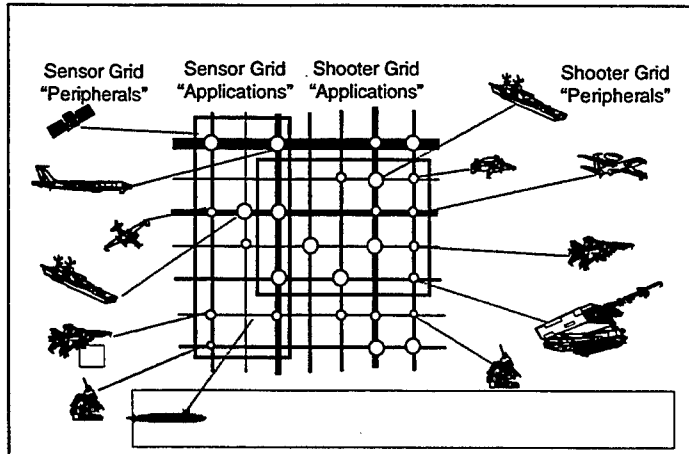
**Total
potential targets
(many thousands)**





NETWORK-CENTRIC NAVY

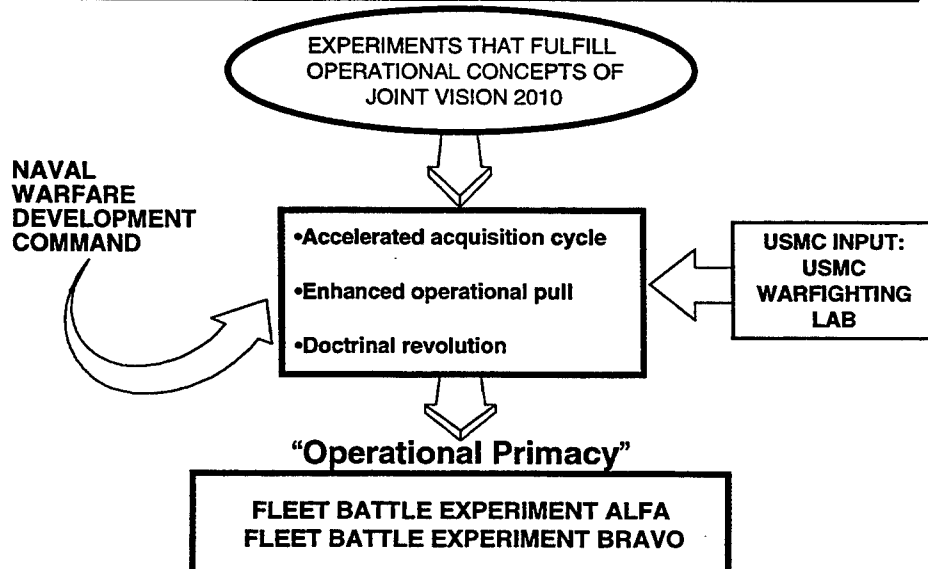
Shifting the initiative
... through self-synchronization and speed of command



- CEC/JCTN
- TADIL-J
- GCCS



FLEET BATTLE EXPERIMENTS





PLANS

- **Preparation for the next QDR:**
 - Analytic preparatory work
 - Navy Organization
 - Coherent Message



ANALYTIC PREPARATION

- **Analytic tools need to address**
 - Contribution of Maritime forces to Joint operations
 - Now captured in GCAM
 - A broader range of operational scenarios
 - Presence, SSC, OOTW
 - Building modeling capability for these cases
 - Address wider audience than just Naval Services
- **Better understanding of**
 - Demands on forces
 - Required capabilities
 - In light of continuing fiscal constraints



ANALYTIC PREPARATION

- **Innovative tools to understand new concepts:**
 - Network Centric Warfare and Maneuver warfare
 - Ability to directly influence events ashore
 - Full implications of Jointness, especially C4ISR
- **Validation of new modeling tools**
 - JWARS-theater campaign level
 - NSS-below theater level
 - SEAPWR-presence/crisis response
 - New models that move beyond attrition warfare
- **Analysts must do analysis**



THE BOTTOM LINE

- **QDR 2001**
 - New Administration/New Millennium
 - Fiscal environment not likely to be better
- **Need rigorous evaluation of RMA/RBA**
 - Move beyond qualitative assessments
 - Really better?
 - How much savings?
 - How hard culturally, operationally, politically?
- **Keys to being ready:**
 - Capable analysts
 - Good analytic tool box
 - Completed analysis

QDR ANALYSIS ...

AN AIR FORCE PERSPECTIVE

Maj Gen Don Peterson
Assistant DCS, Air and Space Operations
7 April 1998

BRIEFING OUTLINE

- **An Air Force view of Joint studies**
- **QDR 97 Lessons Learned**
- **Air Force preparation for QDR 01**
- **The way ahead ... a Joint approach to QDR 01**

AIR FORCE VIEW OF JOINT STUDIES

As DoD again prepares to assess 21st century defense requirements, we must employ the lessons we found to be so critical in previous attempts:

Recent experiences demonstrated that strategic vision is required to identify the security challenges of the future and how DoD can meet them ...

Operational perspectives then develop capabilities that support our vision ...

And credible Joint analysis, framed and validated by operational wisdom, supports insights into our future defense requirements

AIR FORCE VIEW OF JOINT STUDIES

Future studies must emphasize a fully integrated and collaborative effort between strategists, Service experts and analysts

AIR FORCE VIEW OF JOINT STUDIES

Success depends on how thoroughly analysis informs decision makers and provides them with options and broad insights supported with operationally sound evidentiary data ...

... and a clear appreciation that models, by themselves, can not provide point solutions or conclusive findings

A VIEW OF MODELS

- **Assessment tools enhance the analysis of defense requirements ... however,**
- **The current suite of attrition based, force-on-force models provide limited insights into the impact of RMA, emerging concepts of warfare and many capabilities critical to future defense needs such as:**
 - Asymmetric, parallel, space and information warfare
 - Nodal analysis, strategic targeting, C4ISR, SOF

A VIEW OF MODELS

JWARS may help ... eventually, but *interim* actions are needed for the next QDR

- **“Family of assessment tools” — can incorporate selected features from Service and mission models, wargames, experiments and data from research, tests and combat**
- **TACWAR — can provide a minimally acceptable capability if improvements are made to existing modules**
- **Operational perspectives — increase the plausibility of input data, assumptions and analysis ... results become more credible when framed and validated by operational wisdom**

AIR FORCE VIEW OF JOINT STUDIES

It is also critical to establish linkages between the supporting assessments ...

***... insights into concepts, force structures and
TEMPO must be viewed holistically — not as isolated results***

***This applies to the use of common assumptions, baseline data and
excursions ... and measuring impacts, interrelationships and synergies
across the full spectrum of military operations***

GENERAL INSIGHTS - QDR 97

The organizational approach should be more streamlined and focused ... incorporating:

- **Fewer and smaller senior-level meetings ... attendees at senior meetings should either be able to make decisions or provide wisdom ...**
- **Small, close-knit assessment groups ... of analysts, operations experts and Service/Agency Leads can manage most of the study tasks at the 0-6 level ... with analytical production team support as required**
- **More disciplined information flow ... should reduce inefficient stovepipes ...Service/Agency Leads can be conduits of routine information and guidance between study co-chairs and decision makers**

GENERAL INSIGHTS - QDR 97

Studies must consider the entire context of military employment ... missions, strategies and operational concepts affect each other

- **Tradespace — must assess contributions of all fielded forces**
- **Excursions and sensitivities — should examine a wide range of mission challenges, strategic options and operational capabilities**
- **Study linkages — can assess the interrelationships, synergies, and impacts that various missions/capabilities (and studies) have on each other**

GENERAL INSIGHTS - QDR 97

Study execution is improved by the regular participation of Service functional experts and the application of operational wisdom

- **Assessment tools — how they are employed is as critical as their inherent limitations ... they must realistically portray military capabilities/operations concepts**
- **Input data and assumptions — must be accurate, balanced and operationally sound**
- **Strategic framework — analyses must be framed in context of theater requirements, not parts of campaigns ... need updated scenarios and concepts of warfare ... CINC goals should reflect tomorrow's requirements**

QDR 97 LESSONS LEARNED

DAWMS Part I (Joint Weapons Mix) appropriately considered model limitations and used sound military judgement in developing findings

- Broad insights were developed using military judgement — no point solutions
- Recommendations were provided in terms of phased decision points
- Developmental weapons must meet performance parameters (KPP) before recommendations are implemented
- Interaction of Service experts, senior leaders and study analysts increased the plausibility of results

QDR 97 EXAMPLE

Operational expertise corrected serious problems in DAWMS input data and assumptions

- **Situation:** operationally implausible model output questioned the credibility of weapons mix insights
 - Selection of standoff weapons was unrealistically low
 - Used more than 2 times the weapons dropped in Desert Storm
 - Numerous unsound weapon-target combinations
- **Solution:** Service experts discovered operationally implausible conditions and recommended corrections
 - Target set had been inflated 2 1/2 times DIA projections
 - Unrealistic AAA drawdown created an artificially benign low altitude threat environment
- **Result:** results more believable ... recommendations became accepted "reference case" for DAWMS analysis

QDR 97 EXAMPLE

Operational expertise corrected serious problems in DAWMS input data and assumptions

This demonstrates the dependence of assessment tools on accurate and operationally plausible input data and assumptions ... and the benefits of close coordination between Service experts and analysts

QDR 97 LESSONS LEARNED

- **DAWMS issues requiring further review:**
 - Impact of nodal analysis
 - Survivability/effectiveness of deep helicopter operations
 - Impact of WMD (TMD and attack operations)
 - Impact of new logistics analysis and operational concepts
 - Common weapon effectiveness baseline
 - Probability of Damage (PD)
 - Threshold versus objective requests for developmental weapons
 - Definition of C4ISR degrades

DYNAMIC COMMITMENT

- **Dynamic Commitment (DC) has substantial *potential* for illuminating the impact of the Strategy of Engagement on 21st century requirements, however, DC 97 had shortfalls that must be addressed:**
 - Did not measure force *sufficiency* ... it measured force *availability*
 - Inadequately assessed interrelationships between SSCs/MTWs
 - Did not assess how *well* we did ... or *could* have done
 - Disciplined oversight could have reduced Service over-allocations
 - Incompatibility of force allocation tools limited comparative analysis
 - Interagency and coalition play would increase utility of insights
 - *Must be integrated with warfighting analysis* for useful insights into force structure, TEMPO and readiness

DYNAMIC COMMITMENT

Dynamic Commitment has substantial *potential* for illuminating the impact of the Strategy of Engagement on 21st century requirements, however, DC 97 had shortfalls that must be addressed:

If integrated with other analyses, an expanded Dynamic Commitment process can be extremely useful in the next QDR for assessing missions, capabilities, force requirements and the impacts of DoD support for the Strategy of Engagement

DYNAMIC COMMITMENT INSIGHTS

- **Analysis of the impact of SSCs on TEMPO must include Service perspectives on organization and operations**
 - DC 4 was less demanding on AF than historical record, *however, even the low-conflict construct of DC 4 created TEMPO problems when analyzed using specific AF insights*
 - Aggregation masks impact of deployments ... analyses of Air Force TEMPO must view specific time, command, aircraft
 - Air Force stressed in peak periods (even in less hostile DC4)
- **Other QDR analyses aggregated data — finding lower degrees of impact than the AF analysis of DC4**
- **World-wide SSC commitments disperse forces ... the added stress on TRANSCOM reduces air bridge capability to transport/swing forces to MTWs**

DYNAMIC COMMITMENT INSIGHTS

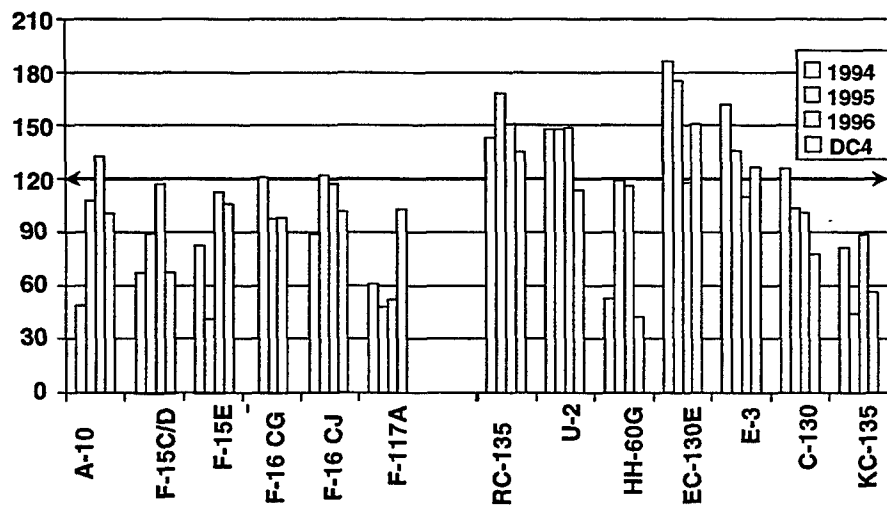
Analysis of the impact of SSCs on TEMPO must include Service perspectives on organization and operations

This highlights the need for:

- Service perspectives
- Linkages between studies
- Additional analysis

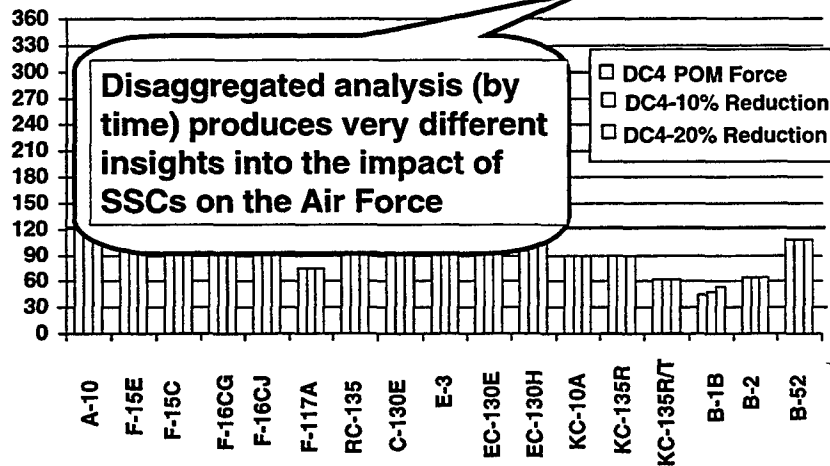
DC4 OPTEMPO/PERSTEMPO

Impact on ACC: 1997-2003 (Aggregated View)



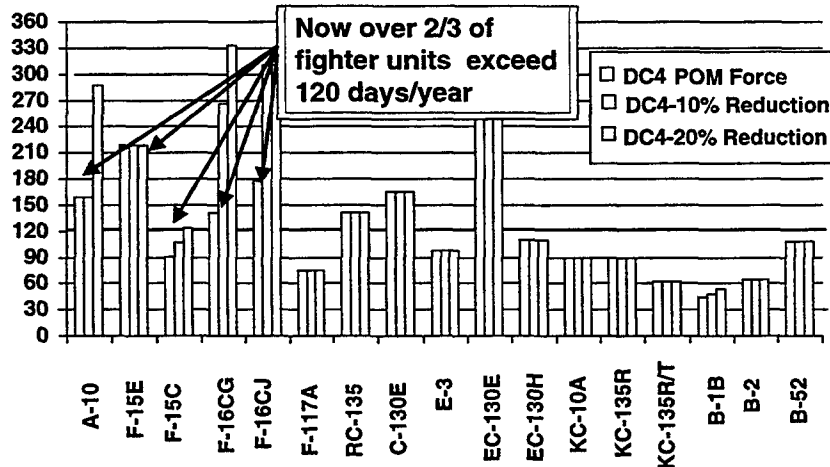
DC4 OPTEMPO/PERSTEMPO

Impact on ACC (Peak Period: 3qtr 1997 - 3qtr 1998)



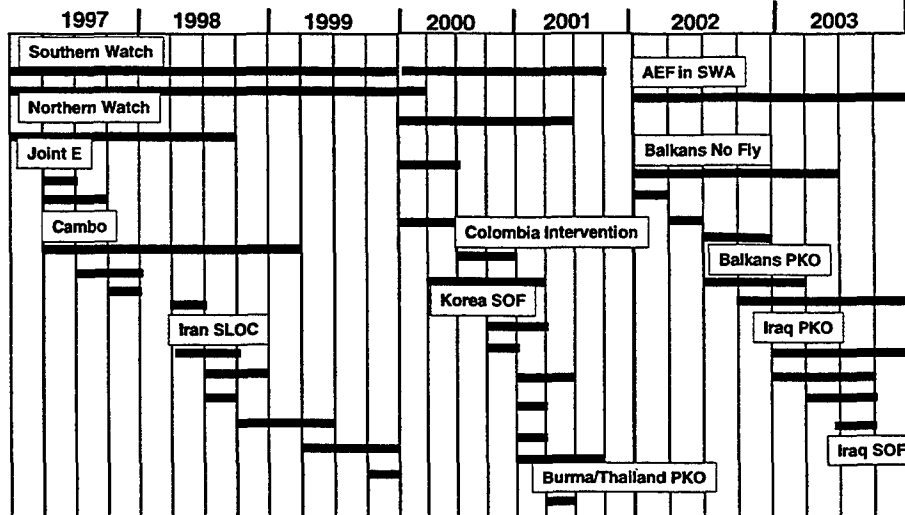
DC4 OPTEMPO/PERSTEMPO

Impact on ACC (Peak Period: 3qtr 1997 - 3qtr 1998)



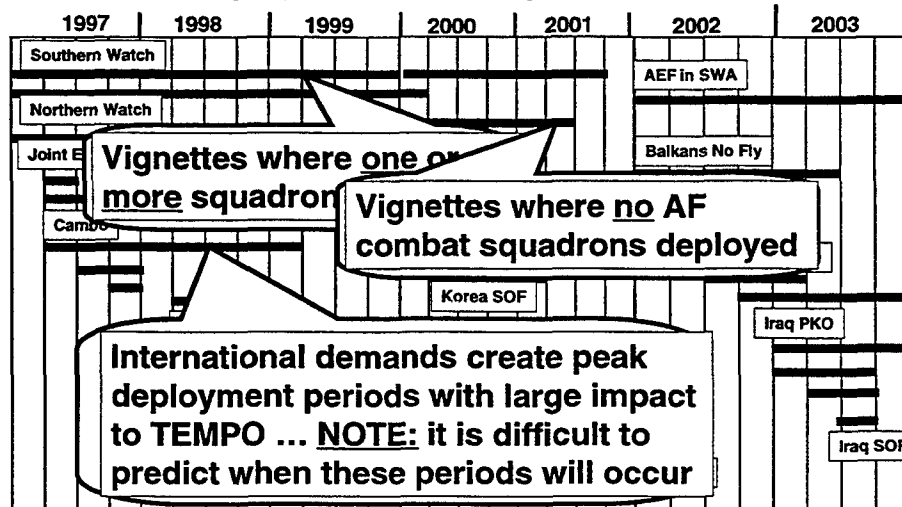
ANALYZING IMPACT OF SSCS

Breakout of deployments reveals peak periods of demand



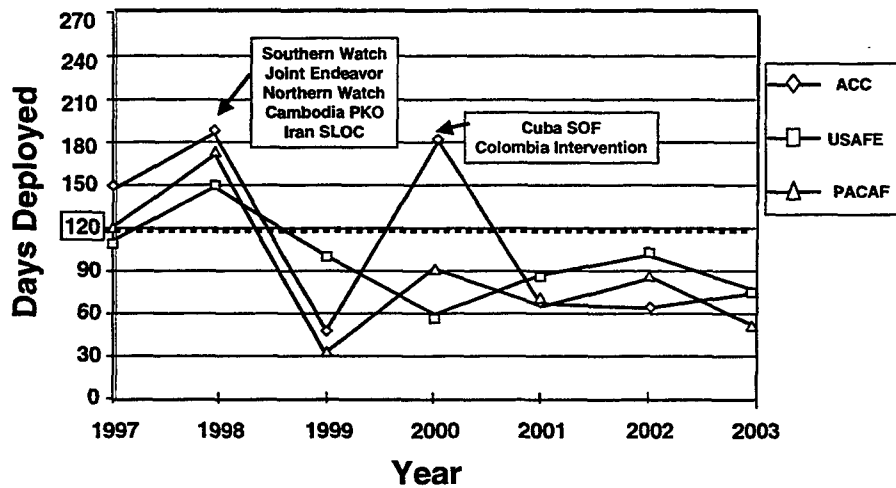
ANALYZING IMPACT OF SSCS

Breakout of deployments reveals peak periods of demand



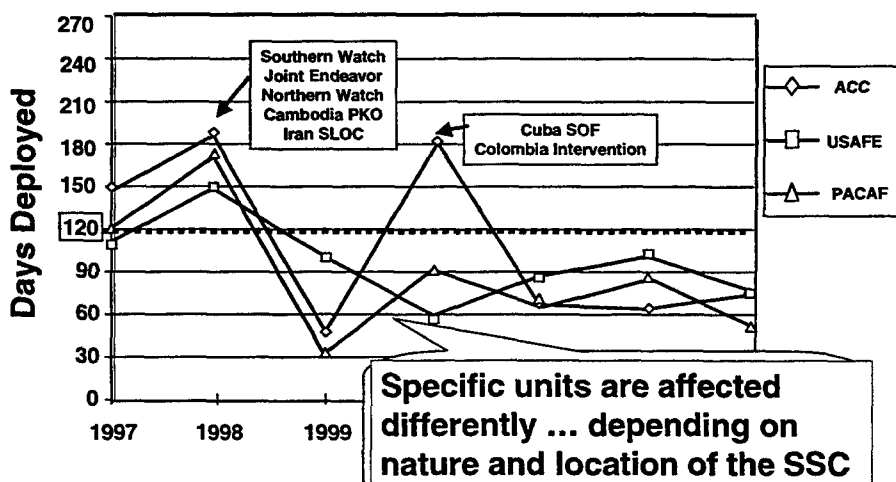
F-15E OPTEMPO/PERSTEMPO

Impact varies with time, command and aircraft type

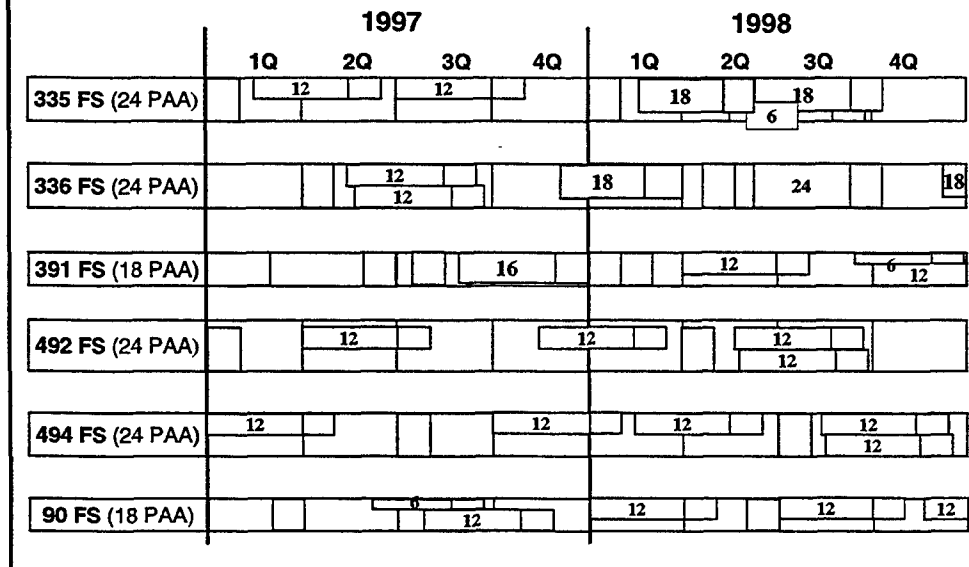


F-15E OPTEMPO/PERSTEMPO

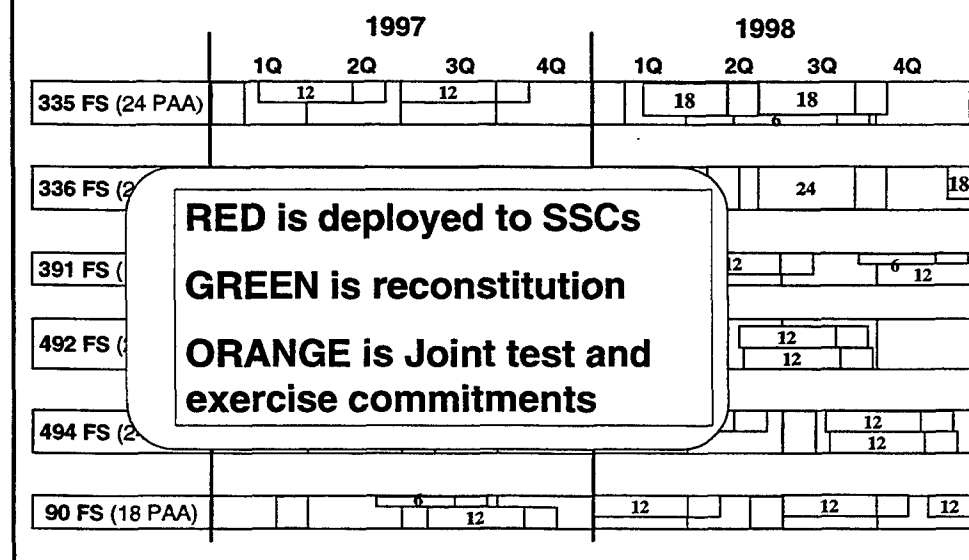
Impact varies with time, command and aircraft type



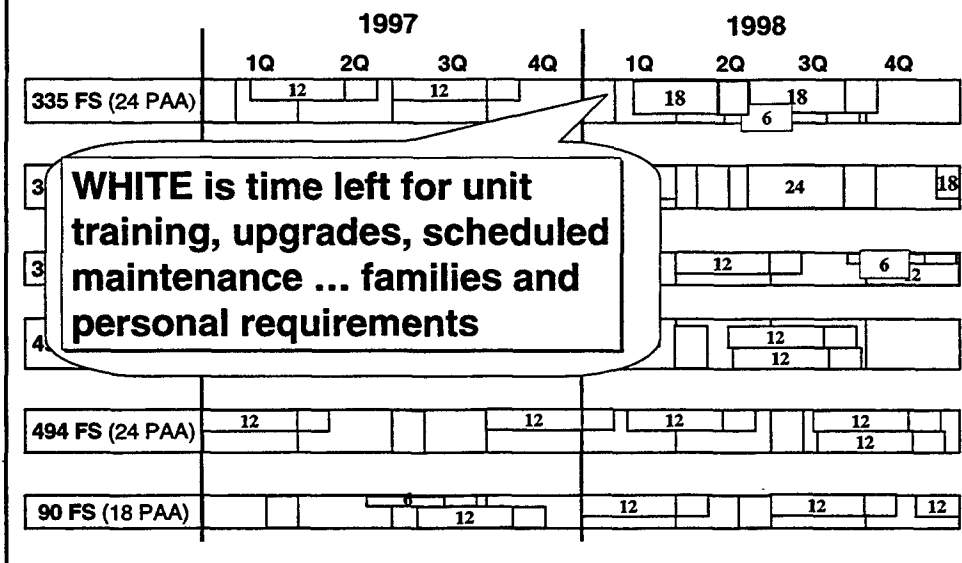
IMPACT OF DEPLOYMENTS (F-15E)



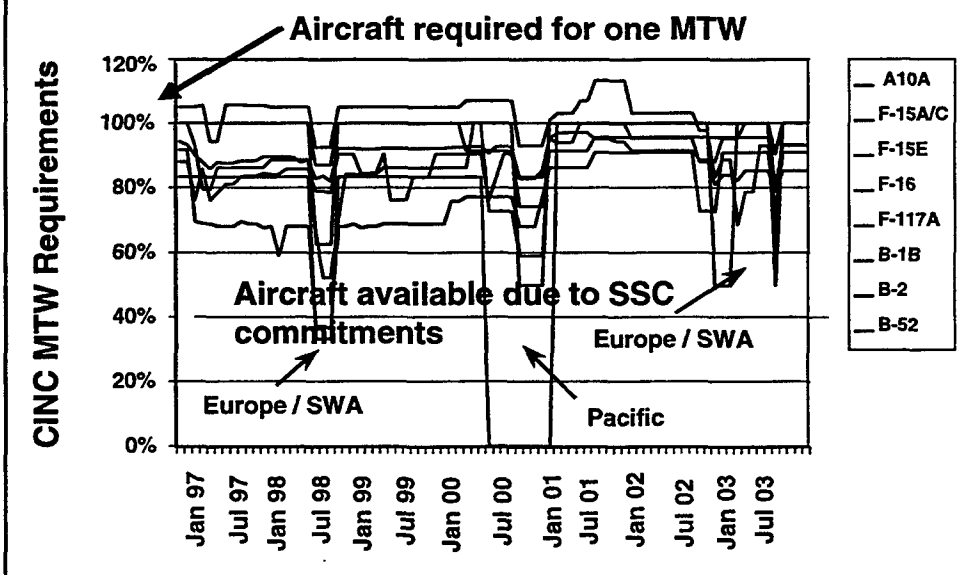
IMPACT OF DEPLOYMENTS (F-15E)



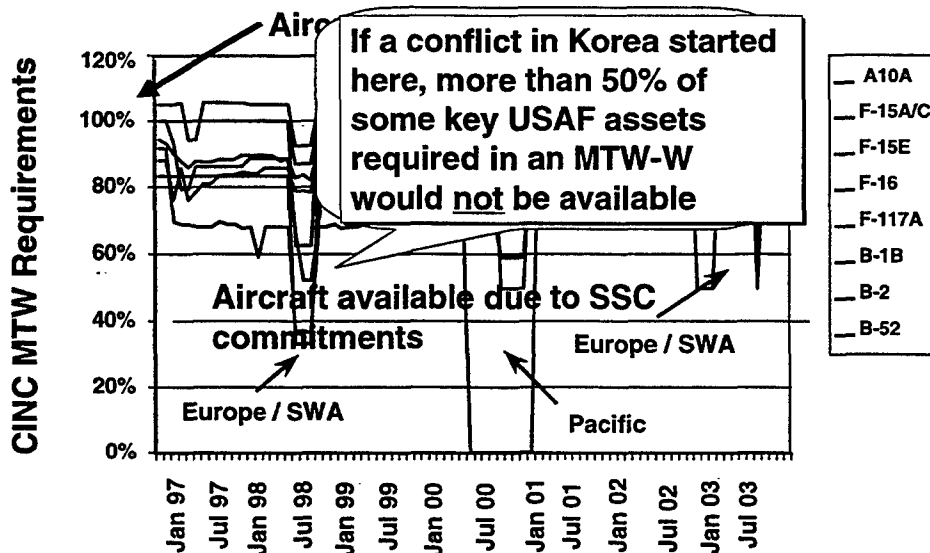
IMPACT OF DEPLOYMENTS (F-15E)



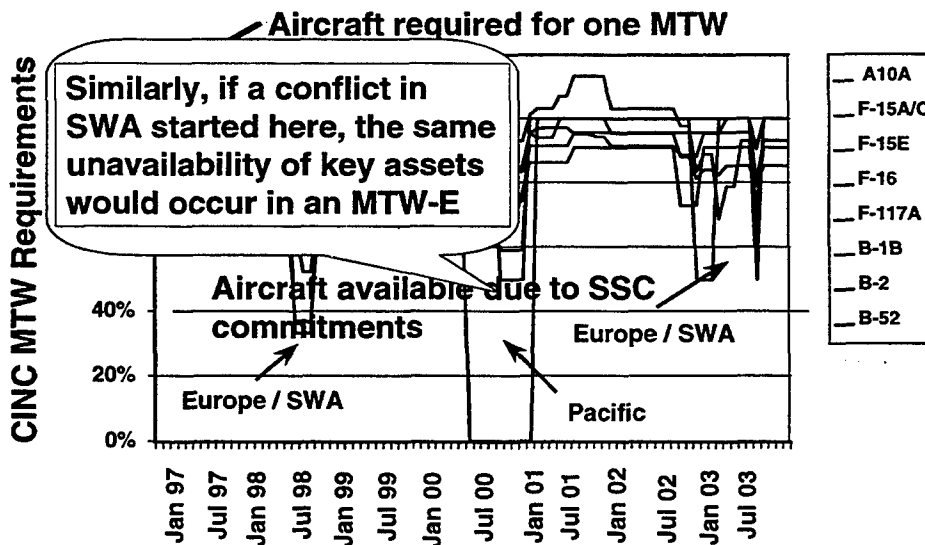
IMPACT OF SSCS ON MTW SUPPORT



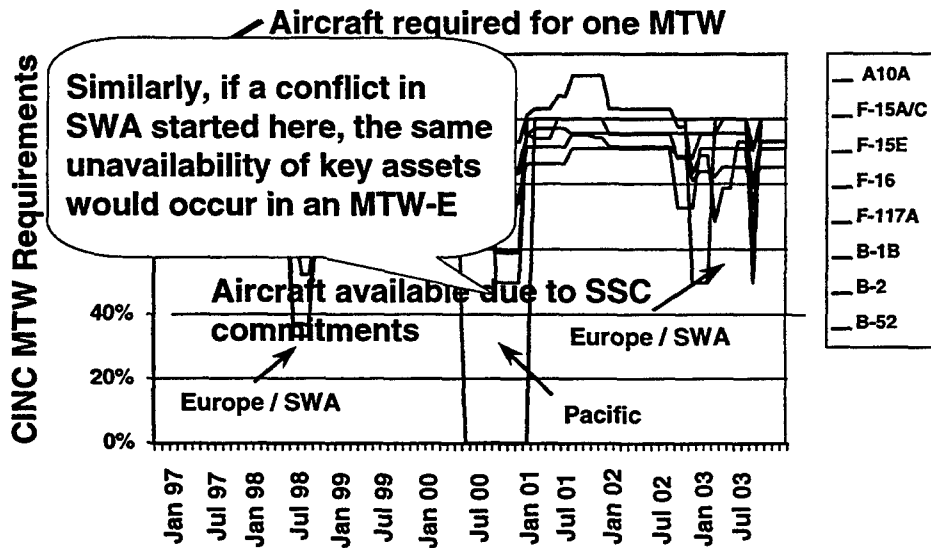
IMPACT OF SSCS ON MTW SUPPORT



IMPACT OF SSCS ON MTW SUPPORT



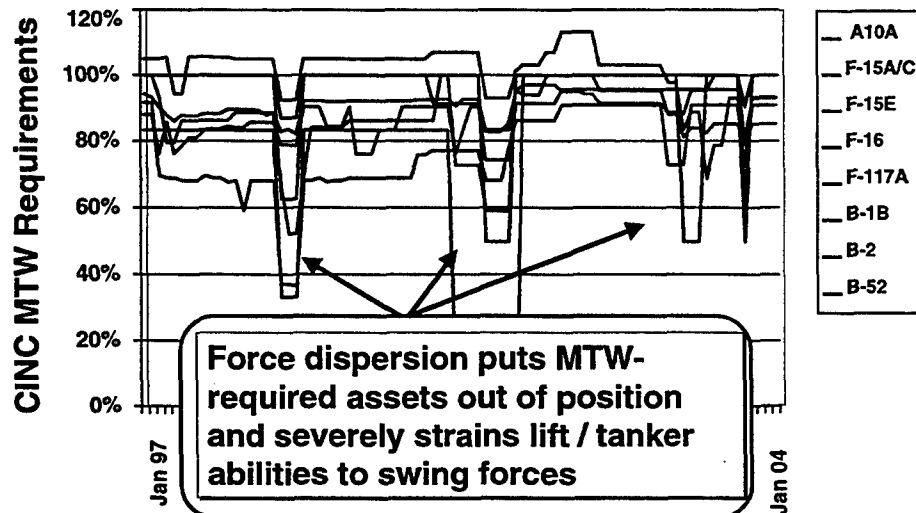
IMPACT OF SSCS ON MTW SUPPORT



This demonstrates the value of integrating insights from an expanded Dynamic Commitment process with logistics, MTW, TEMPO, and force structure assessments

IMPACT OF DEPLOYMENTS ON MTWS

SSCs disperse forces around the globe



These insights are also invaluable to force structure, TEMPO, MTW ... and especially logistics analyses

PREPARING FOR QDR 01

The Air Force has started preparing by assessing the roles, capabilities and requirements of an Expeditionary Air Force ...

- **Air Force Thrusts –**
 - *Template for developing strategies, concepts and budgets*
- **Blue Thunder –**
 - *Long range strategy targeted for the next QDR*
- **Readiness –**
 - *Measuring the near-term impact of deployments on the Force*
- **Full Spectrum Analysis –**
 - *Assessing the role of the RMA and the interrelationships and impacts of MTWs and SSCs on force structure, TEMPO, strategies, operations concepts, infrastructure, personnel*

PREPARING FOR QDR 01

AF is also improving organizations, tools, databases

- **Single point of contact for Joint Studies**
 - *XOJS formerly XO-DAG*
 - *Service Lead for input data, positions, integrating AF support*
- **Database and knowledge enhancement**
 - *Strategic effects study at Air University*
 - *Deep Attack Studies support*
 - *Analysts working with warfighters to support decision makers*
- **Model development (JWARS) /enhancement (TACWAR 5.1)**
 - *Coordination with J-8/WAD*
 - *Air Force TACWAR examination*
- **Model integration ... learning about “family of models”**
 - *Joint campaign and engagement models, linear programs*

PREPARING FOR QDR 01

The AF Experimentation Program uses an integrated approach that examines the new technology and concepts of the RMA ...



Warfare Centers develop innovative operations concepts
Space, Info, Air, Mobility, Security Forces



AF Research Labs apply leading edge technology
Phillips, Wright -Patterson, Rome, Armstrong

Battlelabs advance new warfighting concepts
AEF, Space, IO, Force Protection, UAV, C2BM

PREPARING FOR QDR 01

The Air Force is validating concepts and developing new insights within the framework of JV 2010

- **AF and Joint Wargames**
 - *Global Engagement, '98 Focus (AEF, Rapid Halt, Post-Halt)*
- **Expeditionary Force Experiment (EFX)**
 - *Joint participation, C2 focus, JV2010 orientation*
- **AF and Joint Exercises and Tests**
 - *Red/Blue/Green Flag, JSEAD, TMD-AO, Night CAS*
- **Integration with other Service experiments**

A WAY AHEAD

QDR 97 was very useful, but had flaws — we need to capture and employ its lessons to improve the next QDR

- **Use sufficient sensitivities and excursions to assess the full range of strategies and concepts**
- **Refine databases and information needed for analysis**
- **Enhance tools available for Joint analysis**
 - Employ a “system of assessment tools”
 - Campaign, mission, engagement level models
 - Wargames, seminars
 - Improve and expand Dynamic Commitment concept
 - Increase campaign model capability and fidelity through analyst-operator dialogue ... and the use of existing modules, realistic input data, assumptions and operational decisions
- **Foremost — apply operational expertise throughout**

The “Seven Habits” of Successful Strategic Planning

LtGen Martin R. Steele, USMC
Deputy Chief of Staff for Plans, Policies and
Operations
7 April 1998

**Editors Note: This Presentation Was Retyped By the MORS Office.
Some Of The Art Clips In The Original Presentation Were
Not Available And Are Omitted From This Version.**

BRIEFING OUTLINE

- **Strategic context**
- **Framework — “The Seven Habits”**
- **Assessment of QDR 1997 and challenges for QDR 2001**
- **Conclusions and future directions**

QDR CONTEXT

- **Congressional assertiveness**
- **New Secretary of Defense**
- **Experienced team**
- **Stable strategy**
- **Ongoing RMA/RBA**
- **Perceived strategy/resource gap**
- **Significant modernization shortfall**

FRAMEWORK: 7 ELEMENTS

- **Leadership**
- **Strategy**
- **Structure**
- **Process**
- **Sequencing**
- **Tools**
- **Participant buy in**

1. LEADERSHIP

- **Top down guide**
 - Commander's intent
- **Defined scope and parameters**
- **Stress long term vision**
- **Remain actively engaged**

**SecDef Role Cannot Be
Overemphasized**

CHAOS IN THE LITTORALS

*Strategic
Pause...or
Strategic
Inflection
Point?*

Factors such as shifting economic centers, increasing urbanization, resource shortages, environmental disasters and cultural strife, when combined with a rapid infusion of accessible high-technology weapons and information systems, will change the way our nation projects military power — and the way our adversaries counter us.

— General C. C. Krulak, 1997

2. STRATEGY

- **Goals and end state**
- **Shared vision**
- **Strategy versus fiscal-based tension**

**SecDef Insistence on Strategy-based Approach
Was Vital. JSR Key Factor in Providing Common
View on Future Environment**

QDR STRATEGY

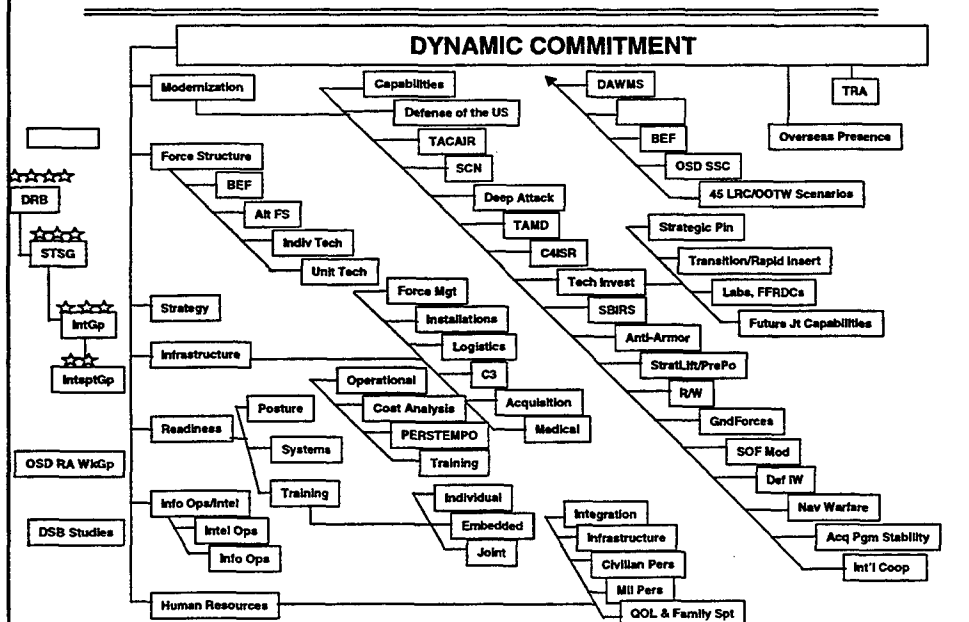
- **Shape**
 - Highlights importance of proactive forward engagement
- **Respond**
 - Diverse portfolio for complex contingencies
- **Prepare now for “Opponent After Next”**
 - Pace of change challenged by NDP

3. STRUCTURE

- Tiered committee approach
- Co-chaired by OSD/Joint Staff
- Numerous panels
- Formal and informal sessions

**Panel Approach Cumbersome
and Time Consuming**

QDR Overview ...



4. PROCESS

- **Ambitious and inclusive review**
- **Collaborative**
- **Concurrency**
- **Major integration challenge**

**Future QDRs Should Focus on
Key Strategic Problems**

5. SEQUENCING

- **Logical flow**
 - Early identification of key issues
 - Development of options
 - Analyses
 - Decisions
- **Better use of senior leadership time**
- **Ensures integration**

**Well Defined Scope and Issue Identification
will Help Define Desired Analyses and
Decision Set**

6. ANALYSES/TOOLS

- **Analytical tools are important**
- **DAWMS/CSEEA and Dynamic Commitment all play a role**
- **Significant disagreements**
 - Tools/models
 - Scenarios

**DoD Needs to Push for Updated Tools
for QDR 2001**

7. "BUY IN"

- **Fundamental component**
- **Major success in QDR 1997**
- **Derived from open, collaborative process and leadership**

**Again SecDef Role Cannot Be
Overemphasized**

QDR 1997 — THE “ENDSTATE”

- Created a consensus on future strategic landscape
- Recognized chaos, uncertainty and asymmetric threats
- Preserved Navy/Marine Corps team as nation’s premier crisis response force

QDR 2001 — THE CHALLENGE

- Moving past consensus about the future to \$
- Determining how to model chaos, uncertainty and asymmetric threats
- Demonstrating how the Navy-Marine Corps team contributes to the strategy

CONCLUSION & FUTURE DIRECTIONS

- **Strategic planning is never easy**
 - Most difficult at strategic inflection points
- **Next QDR will be a major effort**
 - Analytical community will play a role
 - Leadership, strategy and process are key
- **A revolution in military analyses?**
 - Need “information age” tools to assess “information age” warfare

FUTURE VISIONS

FUTURE VISIONS I:

Dr. Ashton Carter, Harvard University "Preventative Defense"

FUTURE VISIONS II:

MajGen Charles D. Link, USAF, Ret "Models and Joint Warfighting"

FUTURE VISIONS III:

Colonel Richard C. Payne, Future Battle Directorate, US Army TRADOC "The Army After Next"

FUTURE VISIONS IV:

RADM Michael McDevitt, USN, Ret Senior Fellow, CNA "The Navy in the 21st Century"

FUTURE VISIONS

Dr. Ashton Carter, Harvard University, Preventive Defense

- **Types of threats**
 - C = SSCs like Bosnia
 - B = 2MTWs
 - A = Near peer, empty today
- **Objective: keep "A" list empty for as long as possible**
 - Prevent threat from emerging while monitoring situation to preclude unexpected
 - Shaping tools include
 - Alliances
 - Partnerships for peace
 - Military-to-military relationships (Schools)
- **Potential "A" list threats**
 - Manage rise to China
 - Military-to-military exchanges
 - Taiwan
 - Proliferation
 - Our presence in Pacific

FUTURE VISIONS

Dr. Ashton Carter, Harvard University, Preventive Defense (cont'd)

- **Potential A list threats (cont'd)**
 - Disposition of past Warsaw Pact Countries
 - WMD legacy in Russia
 - Nuclear
 - Chemical/biological threat
 - Counterproliferation
 - Grand terrorism
 - DoD has best preventive capability
 - Tough problem, need plan

FUTURE VISIONS
Maj Gen Charles Link (USAF, Ret)
Strategy, Models and Joint Warfighting

- **US strategy: "win 2MTWs that occur nearly simultaneously"**
 - But services lack common vision of future conflict..."How we fight"
 - Prevailing view defines military success as controlling territory where only ground forces can overcome an Army...Where airpower is in the support
- **Deep attack weapons mix study (DAWMS) was backdrop for this debate**
 - But DAWMS left these issues unresolved
 - Singularity based on primacy of land combat and...did not address alternative strategies and operational concepts
 - Value of airpower constrained by limitations in legacy campaign models
 - As a result, DAWMS revealed fundamental flaws in US military strategy, Joint warfighting assumptions and legacy models
 - Blue air less effective than anticipated and far less than potential...drawdown of enemy capabilities limited by artificially reduced air sorties
 - TACWAR incapable of modeling intelligent air campaign...no nodal attacks, excessive weather/C4ISR degrades, unrealistic targeting of AAA
 - Attack helos unreasonably effective against deep targets with low attrition
 - Operational wisdom restored plausibility of results — but often ignored

FUTURE VISIONS
Maj Gen Charles Link (USAF, Ret)
Strategy, Models and Joint Warfighting (cont'd)

- **A better way for joint force commanders to win the war?**
 - There are a variety of ways to use specialized competencies of air, land and sea assets to achieve desired results...may not require all three components
 - Joint warfighting may not require simultaneous employment
 - The JFC can reduce enemy capabilities while building theater strength by using air and space power to deny land forces freedom of action
- **Harvesting the RMA to an improved 2MTW strategy**
 - Counteroffensive phase is the culminating point in legacy construct...
 - But perhaps strategy should focus on the halt phase
 - Achieve many US national security objectives
 - Provides the JFC additional options
 - Sanctions
 - Render enemy completely militarily ineffective
 - Continued build-up for land counteroffensive
 - Reduces risk, time, cost to prosecute extended conflict...and friendly casualties

FUTURE VISIONS

Maj Gen Charles Link (USAF, Ret)
Strategy, Models and Joint Warfighting (cont'd)

- **Recommendations**
 - Shift focus of strategy from costly and protracted land wars to using new operational concepts and technology to reduce enemy's capacity to wage war
 - Employ new emphasis in phases of an MTW...move the heavy burden of the warfight from the counteroffensive to the halt phase
 - Achieve military initiatives...stress the coercive opportunities of unconstrained Joint airpower
 - Establish strategic control (eliminate enemy capability to wage war)
 - Consider territorial control an objective vice an end in itself
 - Measure success in achieving policy objectives through results of applying military effects vice measuring progress of land war

FUTURE VISIONS

Maj Gen Charles Link (USAF, Ret)
Strategy, Models and Joint Warfighting (cont'd)

- **Bottom line**
 - Aerospace power can't do it all...still need land and maritime forces
 - But preoccupation with land operations serves to deprive America of the most efficient and effective methods of dealing with distant aggressors...left unchanged, this will lead to unnecessary casualties and risks of failure
 - The foundation of US ascendancy is our ability to operate forces where and when president chooses with acceptable risk...sufficient technical superiority and force size to support strategic pre-eminence

FUTURE VISIONS

**Col Richard Payne, Future Battle Director, TRADOC
ARMY AFTER NEXT**

- **Key to victory**
 - Maneuver
 - Territorial control
- **Need flexible forces**
 - Prepare for changing mission requirements
 - Rapidly deployable forces (need more lift)
 - With tactical speed and killing zones
- **Limitations of bombing**
 - Not significantly reduce will to fight
 - Cause civilian casualties

US Navy in the 21st Century

Talking Points for 9 April Discussion at MORS Conference

Rear Admiral Michael McDevitt, USN (Retired)

- Talking about the future is always a speculative business. Only astrologers and political scientists believe they can predict the future, and it is my belief that they have about the same batting average regarding the accuracy of those predictions.
- In thinking about the future I find that it is useful to think about those things that will not change because often it is these things that have a large role in shaping the future. From a "sailors" perspective the following will be true in the future. What I call strategic verities. (I consider a verity to be a permanent truth.)
- I mention them because as verities they will be a feature of the strategic environment, or in some cases shape the environment in which the 21st century will operate.
 - The three great oceans of the world — the Atlantic, Pacific and Indian, separate the US from many of its vital interests.
 - 70% of the world's surface will remain covered with water.
 - The vast majority of our allies and friends are separated from us by water, but concomitantly they can be reached by water.
 - International waters and the high seas, provide great strategic advantage to those who can exploit them. The high sea cannot be physically captured or legally denied. The only way to control, limit or prohibit operations is through force of arms.
 - The economic health of the US will increasingly depend on trade, the vast majority of which travels by sea.
 - Over 75% of the world's population live within 500 miles of the ocean. That means that the things that support people, or that people need to function in civil society — infrastructure like electrical grids, dams, bridges, cities, transportation nodes etc — are all within weapons reach of ships on the high seas.
 - Because the oceans of the world are vast highways, the Navy will remain a very flexible and agile instrument of power — available to further the interests of the United States and its friends and allies because it can use those highways to travel virtually anywhere.

- The US Navy will operate in a Joint Environment as a member of a joint force. It appears impossible to me that it would be possible, even if one elected to try, to turn back the clock and have a less joint military establishment in the future.
- And finally, the oceans of the world will not become transparent, as a result finding and successfully attacking a submarine will remain the most difficult individual task in all of warfare.
- I hasten to add as a verity, although it is not strategic in the sense I have been addressing, that the Navy Department will consist of a Navy and a Marine Corps. The environment I have described makes "soldiers from the sea" an absolute necessity.
- Now, having set the stage I am going to provide you with two key points that will form a context for my talk.
- First, a word about the operational way of life — the organizational culture — of the Navy. This culture has been in place since shortly after World War II and is likely to remain in place well into the next century.
- That culture is one that revolves around regularly scheduled operational deployments from homeports in the United States to overseas locations. The entire administrative, training and operational preoccupation of the US Navy and the USMC is on these deployments.
- By deployments I mean a routinely scheduled, predictable pattern where ships leave their homeports in the United States and remain away for six or more months. Virtually all ships and submarines will do this once every 18 to 24 months, unless they are in an extended refit period in a shipyard.
- The normal destination for these deployments is the Western Pacific, the Indian Ocean/ Persian Gulf region or the Mediterranean Sea.
- The basic rhythm of the peacetime navy is, and will continue to be — train and prepare for deployment, conduct the 6 month deployment, return for rest and refit and then start to prepare once again.
- This is the process that allows the Navy to maintain continuous presence in oceans far away from the United States.
- Since forward presence is a bedrock concept of the US National Military Strategy the deployment process I have just described is unlikely to change. It is the Navy and Marine Corps contribution to the strategic objective of "shaping the environment."

- What this means is that at any given time approximately one third of the Navy's ships are deployed. In the future the number of vital hubs deployment may change, but I would expect, if there are fewer hubs, that the size of the Navy would shrink as well; because in the absence of a potential global war, to a large degree the Navy has hitched its force structure wagon to today's rotational deployment pattern.
- The second point I want to make has to do with recent history.
- During the Cold War the Navy had a dual focus. On the one hand it trained and exercised for conflict with the Soviet Union. Training preparations for overseas deployments were almost entirely focused on the Soviets.
- But, when actually deployed the Navy and Marine Corps were used most frequently as a crisis response force in situations that often had very little to do with the Soviet Union.
- The assumption during the Cold War — not always a correct assumption — was that if one was ready to deal with the Soviets they could deal with any other problems.
- Since the end of the Cold War this focus on training for a Soviet threat has disappeared. The Navy has been freed from the cold war shackles of preparing for the worst but least likely situation — global war — and is now able to prepare for the most likely situation; crises in the littoral areas of the world.
- This orientation toward the littoral regions of the world represents a fundamental conceptual change from the way the Navy prepares itself for potential hostilities.
- Since 1992 the operational focus of the US Navy has shifted to operations specifically intended to influence events ashore.
- This is a very important shift in operational orientation. The Navy has evolved tactically from one that was oriented to defeating the Soviet Navy before it could project power against land targets, to a Navy that assumes it can brush aside any high seas enemy challenge and move directly into position to attack targets on the land. As you will see shortly this belief is going to be reflected in a new class of warships.
- This orientation against the littoral land areas will remain true for at least the next 20 years; probably longer, because it would take at least that amount of time for any potential foe to build a capable enough force, even an asymmetric force of submarines and ballistic missiles, to contest the high seas with the USN.
- The main threat the Navy sees in the future comes from attacks launched from ashore — missiles and aircraft — and from more "traditional" weapons such as submarines and mines. A classic sea denial strategy. And, of course from information operations intended to disrupt navy data links and communications.

- Let me shift focus to today's navy. It is a new navy; the average age of ships is around 10 to 12 years. It is disproportionately oriented to the "high end." By that I mean very complex multi-mission highly sophisticated warships.
- The reason for this is straightforward. In 1988 the Navy had almost 600 ships. Today it has 348, a 40 percent reduction. This reduction was accomplished by decommissioning older or less sophisticated ships. As a result today's Navy is much smaller but ship for ship is very capable.
- But we still have some shrinking to do. According to the recently completed Quadrennial Defense Review, know as the QDR, the Navy will become even smaller by the turn of the century. Somewhere around the year 2002 or 2003 Navy size will stabilize at around 300 ships.
- Let me show you what I believe this will look like, I want to emphasize that trying to predict precise force structure 5 to 6 years in advance is highly speculative.

CIRCA 2002 NAVY

Aircraft Carriers	12
(Carrier Air Wings	11)
Cruisers/Destroyers	110
Amphibious Ships	36
Attack Submarines	50
Strategic Submarines	14
Logistics Ships	32
Minesweepers, salvage and other auxiliaries	40
TOTAL	300

- A couple of important points about this Navy.
- First, in the year 2025 some 52% of these ships will still be in commission. The average operational life of a modern warship ranges between 25 and 40 years. This is important because much of the Navy that is in the water today will still be in the fleet for over a decade. It takes a long time for a navy to completely change over.
- Furthermore, as we have seen in many of the ships that have been transferred to foreign navies over the years; even destroyer sized warships can remain in an active force for over 40 years.

- The key factor in deciding when to put ships out of commission is the capability of their weapons. When installed weapons systems can no longer cope with more modern enemy weapons, cost trade-off decisions have to be made. The same ones we all make when we crack a block in a 12 year old car; do we rebuild the engine or buy a new car? Does it cost "too much" given the age of the ship to totally replace or upgrade their combat systems.
- But, over the next decade or so there may be good news. There could be a long hiatus in the development of new more sophisticated threat systems because not much money world wide is going into military R&D. The threat may plateau for a time rather than continue to evolve, as it did during the Cold War. Ships may be able to be kept in service longer with only minor modernization work.
- Second. As you can see every aspect of naval power is represented in this listing of ships. In this respect the year 2002 Navy remains a balanced force, something the Navy has consciously tried to sustain since the end of World War I (1918). A "balanced navy" was the 1920 and 30's equivalent slogan to today's "full range of capabilities."
- By balanced I mean that it is able to accomplish the full range of maritime tasks. No one capability has been sacrificed in order to sustain another. This means that this is a low risk to the country Navy because all eventualities are addressed.
- This balanced force is necessary because the Navy of the future will have to sustain the following eight **core competencies**. In other words the Navy of the future will have to be able to do all of the following well:
 - *Achieve and sustain command of the sea, where and when needed.* And sustain that command for as long as necessary for the country to accomplish an expeditionary mission. (This naturally implies being able to deal with mines)
 - *Sustain indefinitely, in the three major overseas deployment hubs, a credible maritime presence.* By credible I mean that the maritime force that is forward deployed has enough warfighting capability to successfully attack over a period of several days, with aircraft or cruise missiles, important targets ashore.
 - *Conduct high performance jet aircraft operations from the sea.* The ability to routinely operate **large numbers** of sea based aircraft; to provide air support for troops ashore, that can gain air control over a hostile country and conduct a precision bombing campaign must remain a nearly unique USN capability.
 - *Submarine operations.* Today's submarine force is the best in the world. Maintain the ability to attack undetected and sink any warship that ventures on to the high seas. Submarine operations also includes the ability to find and

destroy hostile submarines — probably the single most difficult task in all of warfare.

- *Amphibious assault.* A capability that is essential for a country who has many vital interests and most of its allies and friends on separate continents. Seizing a foothold on a hostile shore will remain an important tool available to the country. It will also be an increasingly unique capability that only the US will possess.
- *Transoceanic movement.* By this I mean the ability to move and sustain much of the armed forces of the United States across the open ocean. Most of the military capability of the United States is physically located in the US. To support the countries expeditionary National Military Strategy it must be moved, by sea, to areas of conflict.
- *Precision engagement from the sea.* Possess the weapons, networks and display systems to be able to fully exploit and use the surveillance and targeting capabilities the information age is making available to all US forces. Be able to support ground forces and attack targets with a variety of weapons from between the shore-line to a range of 1000nm in-land.
- *Operational exploitation of information technologies.* Be able to support a Joint Force commander at sea with no loss of effectiveness compared to command from ashore. Be able to conduct offensive and defensive information operations from sea.

These represent the core competencies that I believe the US Navy must possess in the 21st century.

Part IV

Working Groups/Subgroups

WORKING GROUP REPORTS

OVERALL FORCE PLANNING CONCEPTS:

Dr. Paul K. Davis, RAND

FORWARD PRESENCE/ENGAGEMENT:

Mr. Bruce Powers, N81 (Chair)

Mr. Dean Free, N81 (Co-Chair)

SMALL SCALE CONTINGENCIES AND OOTW:

Mr. Fred Frostic, Booz-Allen & Hamilton (Chair)

Mr. Vince Truett, Booz-Allen & Hamilton (Co-Chair)

COMBAT OPERATIONS:

Col Forrest Crain, CAA (Chair)

Ltc Dave Hutchison, HQ Army, PA&E (Co-Chair)

INFORMATION OPERATIONS:

Mr. Stephen E. Meyers, JHU/APL (Chair)

Mr. Wesley L. Hamm, Mitre (Co-Chair)

ASYMMETRIC CHALLENGES:

Dr. Bruce Bennett, RAND (Chair)

Dr. Tom Cedel, TASC (Co-Chair)

FORCE MODERNIZATION:

Col Tom Allen (Chair)

ADVANCED OPERATIONAL CONCEPTS:

Col B.J. Thornburg, AVCSA, Center for Land Warfare (Chair)

Shape:
Dr. George Akst

Respond:
Col Greg Parlier

Prepare:
Col Tom Allen

**REPORT OF WORKING GROUP
OVERALL FORCE PLANNING CONCEPTS**

Paul K. Davis

This report reflects active discussion by the panel on overall force-planning concepts, but there was not enough time for adequate review and iteration, given the number of other important items on the agenda. Thus, the correct ideas should be ascribed to the panel; the errors can be ascribed to the chairman.

POINT OF DEPARTURE: QDR 1997

Strengths

- **Recast strategy in sound terms valid for the long term**
 - Firmly established that the shape, respond and prepare components were all at same top level of importance
- **Concluded that force levels were “about right” — not just for two MRCs, but for reasons of shaping**
- **Changed from a two-MTW “strategy” to a strategy of Shape, Respond and Prepare Now that merely “includes” a two-MTW requirement (not fully defined)**
- **Established need for force transformation**
- **Attempted to be fiscally realistic, and to identify priorities for cost cutting as infrastructure rather than “tooth”**

The working groups were asked to comment on the 1997 QDR as a point of departure. There were significantly differing perspectives on this issue. The QDR's strengths, however, appeared to be as shown in the slide. First and foremost, the new strategy was regarded by the working group as sound. There was consensus on the view that strategy is now about right and that the principal challenges lie in the domains of forces, posture, infrastructure and resources.

The new strategy unambiguously elevates to the top level of importance both shaping and preparing for the future, as well as having capability to respond to a diversity of contingencies, both MTWs and SSCs. As a whole, the strategy strongly encourages both operational adaptiveness at a given time, and strategic adaptiveness over the years and decades.

The QDR also concluded that current force levels are about right — not simply because of the two-MTW requirement, but also because of the demands of peacetime environment shaping, which involve commitments in several major regions and are driving our current forces hard. The two-MTW issue remains controversial (more on this later), but the QDR and Secretary Cohen, in subsequent speeches, has made it clear that the two-MRC criterion is only one among many to be pursued — and is no longer the most important. The two-MTW criterion is, arguably, less stressful for force sizing than shaping.

The QDR laid down a commitment — further encouraged by the NDP and Secretary Cohen subsequently — to embrace useful elements of the RMA in transforming the force for the era ahead. Thus, the “Prepare Now” component of strategy has strong support at the level of exhortation.

The QDR also made important strides toward fiscal responsibility. While perfection was neither possible nor expected here, the DoD clearly identified problems of program under funding, and attempted to address those problems forthrightly. Indeed, recognition of a fifteen billion dollar a year shortfall was a major element of actual QDR decision making.

A year later, skeptics seem to have the upper hand in questioning whether the postulated infrastructure cuts will be achieved. This suggests that difficult structure versus modernization choices lie ahead, although the choice should probably involve reconfiguring forces more than just scaling them down.

QDR (cont'd)

Strengths (cont'd)

- **Moved from threat-based planning to uncertainty-sensitive planning concerned with multiple missions and capabilities**
 - Including contingencies with difficult asymmetric strategies by opponent (short warning, WMD, coalition splitting, homeland threats,...)

Limitations

- **Discussion of transformation was exhortation without programmatic content**
- **Deferred various "too hard" issues (e.g., Army National Guard)**
- **Failed to consider important alternative force postures and programs**

The QDR moved the centroid of thinking and analysis away from point scenarios to a broad appreciation of planning under uncertainty, as reflected in its highlighting of asymmetric strategies involving short warning times, weapons of mass destruction, coalition splitting and homeland threats. All of this was reinforced by the National Defense Panel. There is clearly broad "buy-in" to the general notions of capabilities-based planning, but precisely what that entails is not yet clear.

The QDR also had many limitations — either because of a reasoned decision to defer certain issues because they were not yet ripe for resolution, or because of organizational inability to face up to them as yet. In any case, the most obvious limitation was the QDR's failure to go beyond exhortation in discussing transformation or to provide guidance to the Services on how to go about meeting all the demands of the Shape, Respond, Prepare Now strategy. Trade-offs will be necessary on the margin. Current analytical methods have not been of much help here, which is one of the reasons that the Joint Staff's Dynamic Commitment games were so important.

Some very important micro issues were deferred as "too hard," notably that involving the Army National Guard. And, finally, the panel believed that the QDR failed utterly in generating seriously innovative "strategic" proposals for evaluation. In retrospect — if not to the QDR's participants — two of the three options look like strawmen, with the most "innovative" option involving a mere scale-down of forces to pay for modernization, rather than a restructuring of the nature of those forces. The QDR's transformation language recognized this shortcoming, but deferred serious work on the matter to the future. Analysts must prepare for this.

MORE DETAIL: CONFUSION ON THE TWO-MTW REQUIREMENT

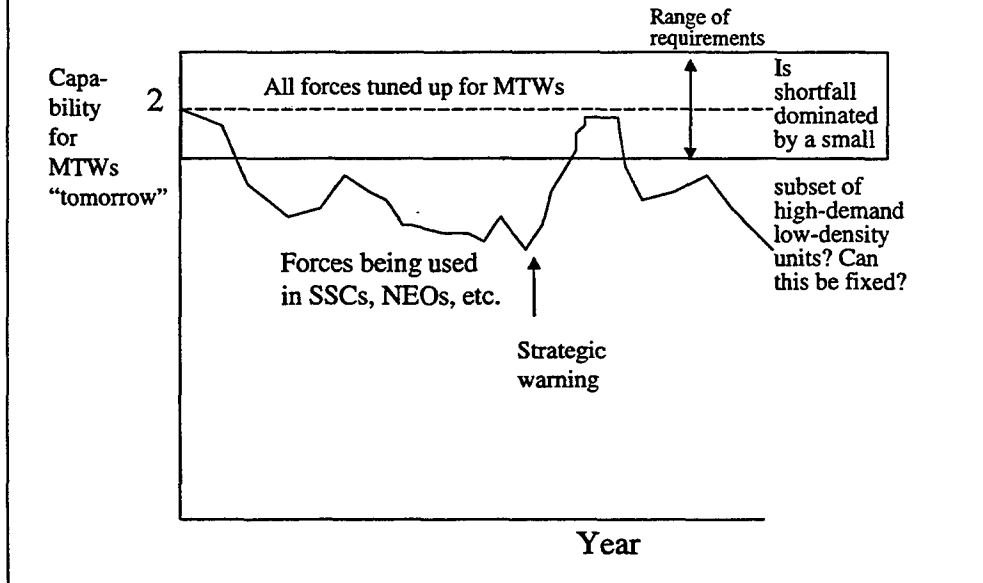
- Capabilities for two MTWs if nothing else is going on *versus* readiness for two MTWs “tomorrow”
- Capabilities to fight and win two MTWs *versus* the implication that this means 10 divisions, 12 CVBGs, 3 MEFs and 20 TFWs.
- Analysis should make these distinctions routinely
- Analysis should illuminate related trades:
 - How much two-MTWs-tomorrow readiness would be lost by increasing the high-demand low-density forces that are at the heart of much of the OPTEMPO difficulties currently?
 - What would really be needed for two MTWs against realistic versions of Iraq, North Korea or other mid-term threats? [Quality versus Quantity]

This said, it is clear that there are problems in maintaining high readiness for two-MRCs “tomorrow” while conducting the wide range of peacetime operations (Bosnia, presence, etc.). Although this has sometimes been minimized by describing it as a mere management problem, the solution to which was to increase the number of units for certain high-demand operations (e.g., AWACS, MPs...), the Services are not finding it easy to “fix” the problems. Aggregated analysis is often misleading because of microscopic effects such as the difficulty in recruiting and retaining AWACS pilots after a succession of missions.

One idea that should be pursued analytically is to make more explicit the difference between buying forces adequate for two overlapping mid-difficulty MTWs if nothing else is going on, versus maintaining high readiness for such a two-MTW situation “tomorrow.” If the forces exist, as the result of programs with a time scale of 3-10 years, then the President may well decide to employ some of the forces for SSCs and other missions in any given period. This inevitably draws down readiness for the two-MTWs-tomorrow case, but it is not clear how much it does so — especially given the weakened nature of the Iraqi and North Korean armed forces, the increased lethality of air and missile forces and other factors. The effect, if it is substantial, probably traces to particular high-demand, high-leverage, low-density capabilities.

A major issue here was seen to be the ambiguity in the “two-MTW” cliché. It clearly means different things to different people. Analysis should make the distinctions noted. It should not assume that the two-MTW requirement legitimizes forever the nature of current forces. It should illuminate tradeoffs between readiness for two-MTWs tomorrow and shaping missions.

DISTINCTION BETWEEN POTENTIAL CAPABILITY AND READINESS



This slide illustrates the point that MTW capability is fuzzy. Even if we look only at "mid-range MTWs" with "mid-range" difficulty, capability varies with time depending on SSCs and the like. There is no necessary contradiction between two-MTW capability (potential) and using forces for SSCs in peacetime, but there is a conflict when one discusses readiness. The analytical and strategic issue here is how much two-MTWs "tomorrow" capability needs to be, and can be sacrificed, in order to support peacetime activities and SSCs. This requires micro-level analysis because the shortfalls are not in the aggregate, but rather in specialty capabilities and units.

PRIORITIES FOR ANALYSIS IN LOOKING AHEAD

- **Since strategy is sound, tinkering with that should have low priority**
- **Priority issues involve future: size, structure and posture of force, and various specific trade-offs**
- **More specific issues include**
 - Resolving tensions among missions (two-MTW readiness versus shaping)
 - Finding new “design points”
 - Reassessing the tokens (divisions, CVBGs, wings and MEFs), and probably changing most of them
 - Better estimating what can be accomplished with managerial reforms
 - Dealing more effectively with risks in programming and budgeting

Looking ahead, now what are the priorities and new issues? There was consensus that since the strategy is sound, tinkering with that — while it may occur — should have low priority, especially for analysis. Instead, the priority issues involve future size, structure, *character* and posture of forces (along with related doctrinal issues), and various specific trade-offs.

Some of the specific issues are those indicated. The two-MTW issue was discussed above, but the others merit some elaboration.

As noted by James Roche in his plenary, “design points” can play a powerful role over many years. We lack consensus on what modern design points should be — in a number of domains. Developing them will not be easy, but a key issue here is reassessing — and probably replacing — the current “tokens of discussion” (divisions, wings, CVBGs and MEFs), which have tremendous baggage with important programmatic and operational consequences. It is essential that analysts (and models) go beyond traditional methods that assume implicitly the appropriateness of these tokens.

A different challenge for analysis is getting into the meat of what can and cannot be accomplished with various managerial changes. The time is past when it is sufficient to wave the flag of the RBA and postulate savings. The DoD has been applying postulated savings for nearly a decade, and it is becoming increasingly difficult to make those be “real.” As in discussions of readiness and OPTEMPO, current aggregate-level analysis is frequently quite wrong. New models and analysis are needed — as well as much better empirical information.

Related to this is the challenge for analysis of programming and budgeting under uncertainty. There are risks associated with most managerial initiatives, but it currently appears as though the bias has been toward optimism, which creates under funding, which is equivalent (in effect) on forces to a cut in congressional funding. Some of the problems here are technical; some, of course, are political. While the DoD may not be able to convince Congress to accept some of the “wedges” needed for current expenditures, the DoD has much more license for the out-years. In the past, the *de facto* “hidden” reserve fund was exaggeration with respect to how many future weapon systems would be procured. Under funding was covered, when the bill came due, by program stretch-outs. That is no longer adequate given the low level of programmed procurement and many other factors.

KEY ATTRIBUTES OF ANALYSIS

Analysis needed most, must:

- **Be *integrative within framework of overall strategy***
- **Unabashedly deal with both “objective” and subjective judgments in a transparent way**
- **Have reductionist and in-depth components**
- **Deal well with uncertainty and risk**
 - Involving the overall environment, contingencies, budgets, managerial initiatives and costs (of people as well as systems)
- **Give visibility to cross-cutting effects**
 - E.g., how various peacetime shaping options affect OPTEMPO, readiness for a two-MRC “tomorrow” and long-term retention

The panel also discussed attributes needed in analysis. There was widespread agreement with the view that what is needed badly is integrative analysis that actually makes use of the new multi-component strategy. Such analysis will necessarily involve a mix of allegedly objective work (as though quantitative model-based analysis were objective) and subjective work. The panel noted that senior leaders have far less difficulty understanding and accepting this than do junior staff. This creates difficulties for analysts, because the demands placed on them by action officers may be precisely wrong in terms of supporting high-level reasoning and insight drawing. Top-down guidance would be quite helpful on this.

There was also consensus that analysis must have different components for different audiences. Some must be reductionist (the key issues in three slides); others must be in depth sufficient to permit leaders' staffs to understand subtleties and protect their leaders from serious errors. Transparency, openness, competition and redundancy are all desirable here.

Another important attribute is the ability to deal well with uncertainty and risk of many different types — whether involving the international security environment or cost uncertainties in the budget.

The last attribute discussed by the panel was the importance of being able to reflect cross-cutting effects. That is, as a particular option is evaluated, it should be possible to “see” how it has a mixture of good and bad effects on different components of strategy on different time scales. For example, actions affecting OPTEMPO have eventual effects on two-MTW capability, of both the “tomorrow” variety and of the variety that assumes some strategic warning. Further, there are long-term effects on personnel retention and the quality of the future force. Currently, such matters have little visibility because analysts' “systems” have often been too narrowly drawn. An interesting exception to this was the Army's work on dynamic strategic planning, which attempts to address the full system of considerations.

OPPORTUNITIES FOR ANALYSIS

- **Put meat on concept of capabilities-based planning**
- **Integrative methods for measuring options by Shape, Respond, and Prepare Now and seeing trade-offs**
 - Across strategy components
 - Within strategy components
- **Apply capabilities-based methods to transformation issues**
 - Challenge problems, assessments, experiments, ...decisions
- **Improve usefulness of analysis in supporting warfighter decision making**
- **Conduct in-depth analysis of support and infrastructure issues — where the money is, and where first-order cuts have exhausted themselves**

This is also an era with opportunities for analysis. Here the slide largely speaks for itself, except that the first item merits discussion. “Capabilities-based planning” is superior to planning for point futures. However, it means different things to different people. In one extreme it can be a blank check: buy all the capabilities that we think we might conceivably need for one thing or another. Or it can be used as an excuse for holding force structure constant (e.g., we should be able to fight two-MTWS and “everyone knows” that this requires 10 Army divisions, 20 Air Force wings, etc.).

The essence of capabilities-based planning is quite different, however. A key element is forcing economic choice by viewing curves of diminishing returns in many different measures of value. How *much* capability of each type is needed? And how badly do we want given levels? What trades are we willing to make when there are budget constraints?

One great virtue of this approach is that it encourages the search for different operational and managerial concepts for accomplishing functional missions. That is, “capabilities” refers to the overall where-with-all needed to accomplish missions. It does *not* refer to numbers of existing force-structure “tokens.”

ACTIVITIES IN PROGRESS

- **DynaRank decision support methodology**
 - Uses objective and subjective measures in hierarchical scorecards keyed to Shape, Respond, Prepare Now
 - Can be seen as portfolio management
- **Increasing use of relatively simple models for “pointed” analysis (e.g., SSC analysis by OUSDP, Halt analyses, AF study of by-component availability versus time)**
- **Improved subjective-analysis methods**

The panel was asked to note activities in progress of value to analysis on overall force structure. The lead presentation here was by Richard Hillestad on RAND's work on portfolio-management methods, an effort to make “practical” RAND's proposals on this prior to and during the development of QDR strategy. The essential concepts here are simple: one wants to have multiple measures of a given option's value. Those measures should be hierarchical. At the highest level, they should include Shape, Respond and Prepare Now, as well as cost. These are the columns of a scorecard. Options constitute the rows. The cells of the resulting scorecard are the value seen of a given option for a given component of overall value. How valuable, for example, would a small JTF-level “vanguard force” using near-to-mid-term RMA technology be in fighting MTWs in difficult circumstances involving short warning and delayed access? How valuable would that same option be in shaping the environment or preparing for future ill-defined contingencies? How valuable for presence and warfighting would capital naval groups be if some number of them had substantial missile-based land-attack capability, area missile defense capability, and so on, but not carrier aircraft? And so on.

The decision support tool briefed (DynaRank) is an attempt to integrate across the components of strategy, in greater or lesser detail as needed. It is not a model, but rather a framework and tool that can include embedded quantitative or subjective models.

Interestingly, DynaRank is similar in spirit to a tool developed and used in the Joint Staff (J-8) during the 1991 era. The panel discussed experience with that tool as well as early results with DynaRank. It concluded that while development of such tools and methods will inevitably take time and involve numerous iterations, something of this sort is precisely what is needed if “integrative analysis” is to be taken literally. Again, the panel noted that senior leaders have more difficulty with subjective judgments — when understandable — than do many figures at lower levels.

ALTERNATIVE METHODS AND OPTIONS

- **Exploratory analysis methods**
- **Multiple approaches exist to “integrating scorecard,” but basic concept seems right**
- **Methods for framing strategic options for next QDR vary**
 - Worldview (e.g., forward deployed versus deploy-as-needed)
 - Managerial method, e.g.,
 - Mission-based planning (Services respond to externally created options representing significant changes)
 - SecDef withhold (Services create options to compete to get back some of “their” funds)
 - MTW oriented (two versus one-plus, etc.)
 - Key is to assure non-incremental options are treated seriously
 - Consensus on need for strategy-relevant rich scoreboard

Other new methods emerging or being improved include exploratory analysis as a mechanism for viewing a vast range of options or circumstances parametrically in order to understand the landscape before going into detail to evaluate particular operational concepts and programs in much higher resolution. RAND has emphasized work of this sort in recent years, and argues that it can be superior to theater-level analysis dependent on large and complex models covering more ground than appropriate for many of the important current issues. At the same time, theater models are critical for integration and for assessing higher-level issues involving joint and combined operations. Here, as elsewhere, there is need for systems of models at different resolution levels, something elaborated upon in a recent NRC study (not discussed by the panel but quite relevant).

CONTINUING DANGERS TO ANALYSIS

- **Continued devotion by some point requirements**
- **Continued devotion by many to burdensome, opaque models inappropriate for much relevant analysis**
- **Continued DoD enthusiasm for Central Planning approach to modeling and simulation**
 - Need diversity, redundancy, competition, evolution, ...
- **Superficiality of viewgraph-intensive “analysis” when dealing with future warfare**
 - **PRIMARY NEEDS:**
 - Warfare-area research to provide underpinnings for theories, models, and data bases (including data on uncertainty)
 - Healthy, close relationships between “operators” and analysts
 - Research on methodological fundamentals [See National Research Council 1997 study on Modeling and Simulation, Vol. 9 of Technology for US Navy and Marines, 2000-2035]

Finally, some words on the continuing threats to good analysis. In this case, the slide speaks for itself.

Although not discussed by the panel, some of these issues have been discussed in considerable detail in a recent study by the National Research Council. That study's conclusions should have implications for development of JWARS, JSIMS, and many other models and simulations.

ANNEX: FOUR POSSIBLE NEXT-QDR PROCESS OPTIONS

- **Shared features:**
 - Three phases, earlier start (preceding March 2000)
 - Timing of QDR (March-June 2001)
 - Assessment teams
 - Participation: regular, open, as in SecDef Review Group and SSG
 - Review/integration structure from start
 - Option development (more top-level guidance and advice, more options, feedback by independent groups)
 - NDP (IF convened, hold main phase a year earlier, finishing by December 2000)
- **Distinctions: size of preparation team and scope of QDR**

Jim Thomason of IDA presented his analysis of options for next-generation QDR process. The panel discussed these at some length. Here the main point to make is that there was consensus on a need to start early with background studies, to enrich the spectrum of options, to bring in outsiders to assure innovation was represented in options, and to have more top-down encouragement of such broad-ranging work early. There are a number of different options depending on the leaders' view of how large the work team should be and how broad the scope of the QDR itself should be (focus on a few key issues versus comprehensive).

SHAPE Working Group Dr. George Akst

- **Very different from warfare modeling**
 - MOEs
 - Tools
- **Presence: need to develop ways to measure certain aspects (deterrence, influence, etc.)**
- **SSCs: need to develop ways to incorporate the contributions of non-military groups**
- **Dynamic Commitment shows promise**
- **Databases: need to begin collecting historical presence and SSC data**
- **Better use of technology to support dissemination of information among analysts**

This slide will serve as an introduction to the two working groups that comprised the shaping composite group: Presence and Small Scale Contingencies (SSCs). The results from each of these working groups will be presented separately.

One of the things that became apparent at the very beginning is that analysis of shaping is very different than the traditional OR techniques used in the analysis of warfighting. We anticipate that not only do the analytical tools need to be different, but even the basic measures of effectiveness will be very different. We make a few observations in each of the working group areas. For presence, some of the MOEs are relatively tractable, even if the current tools are not universally accepted: coverage in geographical areas, and crisis response times. However, many of the aspects of presence are very difficult to measure, such as the ability to influence and to deter. In evaluating SSCs, we need to be careful not to fall into the trap of ignoring the contributions of other organizations, including not only supporting military organizations, but also non-governmental organizations and other international organizations; often, these organizations play a larger role than our own military.

We took a careful look at the Dynamic Commitment process used during the past QDR. While most felt that the process was not perfect, and there was no uniform agreement on what the fixes should be, there was consensus that the process was innovative and did provide promise as a methodology for the future.

SHAPE
Dr. George Akst (cont'd)

- **Very different from warfare modeling**
 - MOEs
 - Tools
- **Presence: need to develop ways to measure certain aspects (deterrence, influence, etc.)**
- **SSCs: need to develop ways to incorporate the contributions of non-military groups**
- **Dynamic Commitment shows promise**
- **Databases: need to begin collecting historical presence and SSC data**
- **Better use of technology to support dissemination of information among analysts**

Both of the working groups pointed out the problems concerning a lack of good, consistent data. Therefore, one of the goals for the next QDR should be to begin to develop databases of both presence (similar to what was collected during the Baseline Engagement Force (BEF)), and for SSCs (to support things like Dynamic Commitment).

One last point before I turn it over to the working groups concerns dissemination of information among analysts. We now have the technology (e-mail, the Internet, etc.) to share information almost as soon as it is produced. While we understand that not all information can be shared (because of classification, or proprietary nature), let's at least make an effort to share the information that is using the technology available to us, to preclude each of us from having to reinvent the wheel for each new analysis.

SHAPE WORKING GROUP

Presence Sub Group

Mr. Bruce Powers

- Presence is
 - Applying resources to shape behavior short of war
- Presence is broadening
 - Not just Naval
 - Not just DoD
 - Not just USG
- MORS issue: how capture?

SHAPE WORKING GROUP

PRESENCE SUB GROUP

Development Of Presence Tools For Next QDR

TOOL	SPONSOR	CAPABILITIES NOW				
		VIGNETTE DEVEL'T	PEACETIME PRESENCE	CRISIS RESPONSE	MOOTW/ SSCs	INTEGRATION
DYNAMIC COMMITMENT	J8/BAH	✓	✓	✓		✓
FORCE PRESENCE MODEL	OSD/PA&E		✓			
SEAPWR	N81/CNA		✓			
SEASTATE	N81	✓	✓			
GCAM	N81		✓	✓	✓	✓
PSYCH/SOCIAL	N091/CNA				✓	
COSTING	MANY, INC OSD/IDA		✓			
IMPACT	N81/USNPGS, SPC		✓	✓		✓

SHAPE WORKING GROUP

SSC SUB GROUP

Mr. Fred Frostic

- **What are Small Scale Contingencies (SSCs)?**
 - Also known as OOTWs, MOOTWs, LICs, and MCOs.
 - Everything but MTWs, forward presence, training and exercises

SHAPE WORKING GROUP

SSC Sub Group

Key Issues/Analytic Approach/Limitations of 1997 QDR

- **Key Issues:**
 - What are the force size and composition requirements for SSCs?
 - Are these requirements met by the forces needed for 2-near simultaneous MTWs?

**SHAPE WORKING GROUP
SSC Sub Group
Key Issues/Analytic Approach/Limitations of 1997 QDR**

- **Analytic approach:**
 - Dynamic Commitment seminars examined force sufficiency and availability for SSCs+.
 - SSC Seminars provided historical insights into full range of SSCs.
 - Base Engagement Force evaluated OPTEMPO/PERSTEMPO.
 - Operational Experience
- **Limitations: schedule, data, objectives**

**SHAPE WORKING GROUP
SSC Sub Group
Key Questions/Issues in Next QDR**

- **Importance:**
 - Force size and composition questions will remain.
 - Depending on status of MTW threats, this analysis could be more important.
- **Analytic approaches:**
 - No analytical breakthroughs in sight.
 - Dynamic Commitment methodology can be improved, automated and supported with a better data base.
 - Support force and logistics requirement tools for SSCs would help.

SHAPE WORKING GROUP
SSC Sub Group
Opportunities for Improvement/Recommendations

- **Start the process now**
 - Identify key issues
 - Outline scope, assumptions, methodologies and models and start practicing now
 - Examine available data bases and fill in the holes
- **Clearly define roles and responsibilities of OSD, JS, Services and CINCs**

RESPOND WORKING GROUP
Combat Operations Sub Group
Col Forrest Crain
Questions/Issues Addressed in 1997 QDR

- **Strategy: NMS - JSCAP - OPLAN based**
- **Scenario: dual MTW w/SSC and WMD (limited)**
- **Timeframe: short term (Current - 2005)**
- **Primary Issue: force requirements**
- **Reactive climate - short Time Lines:**
 - Nothing to gain - Much at risk
 - Perceived as a "Budget Food Fight"

**RESPOND WORKING GROUP
Combat Operations Sub Group
Key Questions/Issues in Next QDR**

- **Issues: (Define as early as Possible)**
 - Overarching Integrator/guidance/data base
 - Strategy, scenarios, timeframe(s) and options
 - Specific issue identification
- **Leadership involved early and engaged throughout**
- **Operator - Analyst interaction a must**
- **Tools: (Cold War Attrition Models)**
 - Physical, mental and moral domains of conflict
 - Attrition Model is only a part of the answer
 - Attrition (cost in lives and equipment) will remain a factor
 - New Models: available/VV&A/trained users?

**RESPOND WORKING GROUP
Combat Operations Sub Group
Concerns**

- **Absence of coordinator/integrator for the next Q Defense R to “take charge”**
- **Parochialism: services will come “armed” to the next “Food Fight”**
- **Analytic tools: (Come as you are?)**
 - Current
 - Current w/enhancements
 - Current and More
 - New

MORE OF THE SAME?

RESPOND WORKING GROUP
Combat Operations Sub Group
Recommendations - for the Analytic Community

- **Prepare: ongoing**
 - Lessons learned
 - Explore issues, methodologies, tools, etc.
 - Continuous process
- **Shape:**
 - Decision maker expectations and goals
 - Help leadership scope problem and issues
- **Respond:**
 - Provide Products w/options, consequences, costs and risks
 - Degree of Analytical Precision — near versus far term

RESPOND WORKING GROUP
Combat Operations Sub Group
Opportunities for Improvement

- **Process:**
 - Tiger Teams
 - Leadership (CINC QDR)
- **Models:**
- **Databases:**
 - JDS, AFM, Other

RESPOND WORKING GROUP
Information Operations Sub Group
Mr. Steve Meyers
Questions/Issues in 1997 QDR

- **Approach:**
 - Collaborative — OSD/Joint Staff
 - Military Services
 - CINCs of Combatant Commands
 - Bottom-up — ideas from throughout DoD
 - Additional ideas and support beyond DoD
 - Top-down — SecDef/CJCS "guided"
 - Structured — three levels/seven review areas
 - PA&E briefed six omitted IO from "IO and Intelligence"
 - Sequential, time-critical "exercise"

RESPOND WORKING GROUP
Information Operations Sub Group
Questions/Issues in 1997 QDR

- **Impact:**
 - Built on past efforts — MTW construct
 - Limited scope
- **Limitations:**
 - C4ISR models
 - Limit appreciation of full impact of IO

RESPOND WORKING GROUP
Information Operations Sub Group
Key Questions/Issues in Next QDR

- **Define IO battlespace**
 - Reconcile Services' views/definitions
 - Defensive — often outside traditional DoD AOR
 - Offensive — often outside traditional DoD warfighting domain
- **Define level of attention for IO**
- **Define IO “trade space”**
 - Be very careful about imposing limitations

RESPOND WORKING GROUP
Information Operations Sub Group
Key Questions/Issues in Next QDR

- **Inter-community (IO):**
 - Stealth/jamming versus numbers of bombers
 - Digitization versus numbers tanks/brigades
 - JTIDS versus numbers of aircraft squadrons
- **Intra-community (IO):**
 - UAVs versus JSTARS
 - Military versus Commercial SATCOM
 - BCIS versus Situational Awareness

RESPOND WORKING GROUP
Information Operations Sub Group
Opportunities for Improvement

- **Modeling approaches:**
 - Space
 - Human decision process
 - Develop links from information to military effectiveness
- **Tools:**
 - Avoid overreliance on one tool (e.g. TACWAR)
 - MOP focused — require better links to MOEs

RESPOND WORKING GROUP
Information Operations Sub Group
Opportunities for Improvement

- **Inputs:**
 - Databases
 - For model building
 - For analysis
 - Operator
 - Keep Battle Staff in the process

RESPOND WORKING GROUP
Information Operations Sub Group
Actions in Progress

- **Leverage and better coordinate on-going efforts**
 - JCS/Service experiments/battle labs
 - Lots of data available
- **JWARS schedule**
 - C4ISR model seen as risk area

RESPOND WORKING GROUP
Information Operations Sub Group
Recommendations

- **Establish high-level guidance now**
 - Draft issues, establish scope
 - Methodology — scenario, mission area?
- **Identify/organize support structure/funds**
 - Establish model/analysis methodologies
 - Specify data types/requirements
 - Identify working level responsibility
 - Establish incentives to do the job correctly

RESPOND WORKING GROUP
Information Operations Sub Group
Recommendations

- Coordinate and leverage on-going efforts
- Support model research and operational experiments as well as M&S builds
- Accredited data and models early in process for each of the review's focus areas (IO)

RESPOND WORKING GROUP
Asymmetric Strategies Sub Group
Dr. Bruce Bennett
Why Worry About Asymmetric Strategies?

- US conventional superiority: adversaries cannot compete symmetrically
- Asymmetric strategies: weaker countries attacking US vulnerabilities in ways we do not appreciate or are ill-prepared to defend
- How much are our 2 MTW calculations like the French Maginot Line calculations?
 - Germans could not win
 - Desperation pressed the Germans to pursue the Ardennes vulnerability, which made the French superiority calculations meaningless

**RESPOND WORKING GROUP
Asymmetric Strategies Sub Group
Questions/Issues Addressed in 1997 QDR**

- **US should expect asymmetric strategies**
 - Received little analysis (lack of data/ understanding, modeling, proponentcy), especially in SSCs
- **Adversary CBW use could seriously impact MTWs**
 - Analysis of CBW oversimplified many issues
 - Add one billion dollars for counter proliferation (focus: CW)

**RESPOND WORKING GROUP
Asymmetric Strategies Sub Group
Key Questions/Issues in Next QDR**

- **What options are available for adversaries to attack US interests and “win”?**
 - What are US/allied vulnerabilities
 - Need a Quadrennial Intelligence Assessment?
- **How would such adversary actions impact US/allied forces and interests?**
- **What must the US/allies do to deter and/or defeat such actions?**
 - Did QDR 1997 investments make a difference?

RESPOND WORKING GROUP
Asymmetric Strategies Sub Group
Opportunities for Improvement

- **Explore asymmetric strategies and CONOPs**
 - Think like our adversaries (seminars, war games)
 - Tools to assess these (qualitative--->quantitative)
- **Develop strategies to counter adversary threats**
 - Employing military capabilities, info ops, ...
- **Define effects**
 - For CBW: Data (EM-1 for CBW?), formulation [tutorial on operational impacts?], experimentation, models
 - Other weapons: ...
- **Develop analytic approaches**
 - Roles for models, analyst/model interfaces, data

RESPOND WORKING GROUP
Asymmetric Strategies Sub Group
Actions in Progress

- **Status: current grade of "D" in understanding and analytic capabilities**
- **DSWA work**
 - CBW delivery by Scud C
 - VX absorption into concrete, ...
 - Patriot performance, ...
- **Work by J-8 on theater defense against CBW**
- **Work by AF/XON on "Fighting the Base"**
- **Work by TRANSCOM on decontamination**
- **Work by commands on changing plans**

**RESPOND WORKING GROUP
Asymmetric Strategies Sub Group
Recommendations**

- **Define a threat menu, OSD/IC, 7/99-6/00**
 - Key to US/allied vulnerabilities
 - Include state threats, non-state actor threats
- **Develop a strategy menu, OSD/JS, 1/00-10/00**
 - Enhanced focus on deterrence
 - Prioritization of strategy elements
- **Analytic preparations, OSD/JS/Svcs, 99-00**
 - Effects, tutorial manuals needed
 - Develop approach, melding analysts/models

QDR Analysis: Lessons Learned and Future Directions

**Prepare Working Group
Modernization and New CONOPS**

**Col Tom Allen
Col B.J. Thornberg**

PREPARE WORKING GROUP Questions/Issues in 1997 QDR

- **Overarching approach not coherent**
- **Conflict in problem statement:**
 - Strategy review? Balance readiness, force structure, modernization? Cut drill?
 - Exacerbated by time crunch
 - Resulted in stove pipe efforts/defensive behavior
- **Led to disconnects between threat, strategy, required capabilities, force structure**
 - Tradespace between current requirements and future needs particularly difficult to illuminate

PREPARE WORKING GROUP
Questions/Issues in 1997 QDR (2)

- **No clear prioritization scheme**
 - Linkage between capabilities and force structure
 - No clear statement of capability, cost and risk of alternatives
- **Lack of data**
 - No common definitions/metrics
 - Validated across services/agencies
 - Lack of documentation
 - Cost data particularly challenging, hard to project

PREPARE WORKING GROUP
Questions/Issues in 1997 QDR (3)

- **Gaps in Tools and Knowledge**
 - C4ISR, space, information operations, urban operations, terrorism, SSCs
 - Joint models lacked fidelity, linkages, sensitivity to maneuver, effects of strategic targeting
 - Operations perspective gaps in model application
- **Structure**
 - Unwieldy; lacked clear process for cross-service or cross-mission comparison; system vice capability focus
- **Technology**
 - What's needed versus what's possible

PREPARE WORKING GROUP

Key Questions/Issues in Next QDR

- Need to refine answers to '97: What range of threats ⇒ strategy ⇒ capabilities ⇒ forces
- What gaps/overlaps in capabilities? What risks?
- Balance questions: forces to infrastructure; active to reserves; US to coalition; SSC to MTW; technology to force size; lift
- How to manage, integrate joint experimentation
- Acquisition issues: investment strategies, process streamlining, push versus pull, technological risk assessment

PREPARE WORKING GROUP

Opportunities for Improvement

- **Timing**
 - Begin now; set baseline
 - Continuous data collection; establish format/standards
 - Collaborative efforts
 - Early identification of issues
- **Process**
 - Establish QDR Planning and Integration Group (QPIG)
 - Streamline and simplify
 - Embed as much as possible in existing structure
 - Timely threat and strategy updates
 - Create capabilities map

PREPARE WORKING GROUP

Opportunities for Improvement (2)

- **Tools**
 - Better integration; family of models
 - Take advantage of new capabilities, technologies
 - Joint models to facilitate understanding of trade space
- **Expertise**
 - Continue to improve analytical and technical capabilities
 - Applies to analysts, operators and decision makers

PREPARE WORKING GROUP

Actions in Progress

- **Tools: JAMIP/JWARS/JSIMS, LPs and other model improvements**
- **Updating DAWMS, readiness, SSC databases**
- **JV 2010 and service visions**
- **Experimentation, ACTDs, and Joint Tests**
- **Joint Study Activities:**
 - JWCAs, Mobility Requirements Study, RMA (Joint Advanced Warfighting Center), Joint Battle Center/Decision Support Center, Joint Warfighting Center, Title 10 Wargames

PREPARE WORKING GROUP
Recommendations

- Establish QPIG/begin preparations now (JCS, OSD)
- Develop capabilities map (services, JCS)
- Identify and begin to collect appropriate data in standardized formats (OSD, JCS)
- Start now to identify issues to direct studies and experiments (all)
- Streamline process — panels, subpanels, etc (all)
- Establish more effective study clearing house (OSD)
- Improve knowledge base, modeling capability (all)



Terms of Reference
Military Operations Research Society
Mini-Symposium and Workshop
QDR ANALYSIS: Lessons Learned and Future Directions
7-9 April 1998
Johns Hopkins University APL, Laurel Maryland

A. BACKGROUND

The Quadrennial Defense Review (QDR)

The "Military Force Structure Review Act of 1996," which was part of the FY 97 Defense Authorization Act, required the Department of Defense to carry out a fundamental and comprehensive examination of America's defense needs from 1997 to 2015. This review included analysis of anticipated United States national security requirements, the defense strategy to meet these requirements, and the force structure, capabilities, and investments needed to implement this strategy.

In addition, the legislation established a "National Defense Panel" to perform an independent analysis from outside DoD.

The legislation calls for similar reviews to be conducted every four years.

Although the major conclusions of the QDR of necessity represent informed judgment by the most senior military and civilian officials in the DoD, the QDR process was supported in 1996-97 by a large body of military analysis. Major inputs included the Deep Attack Weapons Mix Study (DAWMS) Part I (Weapons Mix Analysis) and Part 2 (B-2 Tradeoff Analysis), the Global Regional Power Study, C4ISR Mission Assessment, and Dynamic Commitment. All of these studies had extensive participation by OSD, Joint Staff and the four Services. In addition, the Services used analysis to develop and support their positions.

It is highly likely that the analytical community will be called upon to play a major supporting role for the QDR scheduled for 2001. This meeting should help the Department prepare for this important event.

Recent MORS Activity

The 65th MORSS (June 1997 at Quantico) included extensive reporting on the QDR process and on the analytical work involved. Presentations were made by OSD and the Services to include general sessions presented by Mr. Bill Lynn, (Director, PA&E) and Mr. Lou Finch, (DUSD Personnel and Readiness). A complete list of these presentations is attached. It should be noted that the MORSS took place very shortly after the

completion of the QDR, and much of this reporting suggested that further reflection on the lessons of the QDR would be desirable.

Another major MORS event that preceded the QDR was the October 1996 mini-symposium and workshop on quick response analysis methodologies (QRAM). The workshop was framed around anticipated issue categories for the 1997 QDR. The objectives of this special meeting were:

- To use the skills of outstanding analysts across DoD to explore senior leaders' requirements for quick response analysis of major issue categories.
- To use an organized analytic approach to frame these issue categories and to provide demonstrations of the application of this approach using existing case studies.
- To apply the organized analytic approach to specific issue questions within the issue categories, to identify applicable quick response analysis methodologies, or to identify shortcomings in current response capabilities.

B. PURPOSES

This special meeting will identify actions that could usefully be taken and research that could usefully be carried out over the next 2-3 years in order to maximize the quality and the utility of the projected 2001 QDR.

More specifically, lessons learned from the 1997 QDR and similar large-scale planning efforts will assist the military analysis community in its future work. These lessons will include insights into:

- The characteristics of an analysis that will make it most useful to senior policy-makers.
- The analysts-decision maker interactions needed to provide effective analytical support.
- Structuring an analytical approach that is consistent with the constraints which any large planning effort is likely to impose on analysis.
- The relative effectiveness of various analytical techniques, and approaches to improving these techniques over time.
- Innovative approaches to large-scale defense planning.

C. ADMINISTRATIVE

- Dates: April 7, 8, 9 1998
- Place: Kossiakoff Center, The Johns Hopkins University Applied Physics Lab, Laurel, MD
- Classification: SECRET
- Participants may attend just the Mini-Symposium on the 7th. However, all participants in the workshop on Days 2 and 3 should attend Day 1. The registration fees are as follows: Mini-Symposium only (Day 1): U.S. Federal Government--\$75;

all others \$150. Mini-Symposium and Workshop (Days 1, 2 and 3)—U.S. Federal Government--\$175; all others--\$350.

D. TENTATIVE AGENDA

A three-day program is planned; a one-day Mini-Symposium and a two-day Workshop.

Section 1. (Mini-Symposium). All of the first day will be devoted to a series of speakers, who will address plenary sessions. (Note: the order below may be adjusted based on speaker availability.)

Call to Order	Program Chair MORS President	Mr. Mike Leonard Dr. Jerry Kotchka	(5 minutes)
Workshop Overview and Historical Perspective		Mr. Mike Leonard	(30 minutes)
Keynote Presentations	Moderator	General Larry Welch	(USAF, Ret)
	(1) OSD Analysis	Dr. Gilmore	(30 minutes)
	(2) OSD Policy	Ms. Flournoy	(30 minutes)
	(3) JCS	TBD	(30 minutes)
	(4) National Defense Panel	ADM Jeremiah (USN, Ret)	(30 minutes)
	(5) Congress	Senator Coats	(30 minutes)
	Keynote Panel	All	(30 minutes)
Luncheon Speaker	Corporate Perspective	Dr. Jim Roche	(1 hour)
Service Presentations	(Lessons Learned/Actions Taken/Plans for the Future)	Moderator – LtGen Van Riper (USMC Ret)	
	Army	Dr. Buckelew	(25 minutes)
	Navy	VADM Lautenbacher	(25 minutes)
	Air Force	MajGen (SEL) Wald	(25 minutes)
	Marines	TBD	(25 minutes)
	Service Panel	All	(45 minutes)
Wrap-Up Mixer	N/A	Dr. David Chu	(1 Hour)

Section 2. (Workshop). The Workshop portion is split into four working groups, with three having additional breakouts called subgroups. Some sessions will take place at the working group level and others at the subgroup level. Featured presentations will tend to be at the working group level. The subgroups will include both presentations and problem-solving discussions. The entire conference will meet in the late afternoon of day 3 for a presentation by the synthesis group.

The Working Groups are Overall Force Planning Concepts, Shape, Respond, Prepare.

A. Overall Force Planning Concepts: Chair: Dr. Paul Davis (RAND)

This working group will focus on overall force planning concepts. Since the late 1960s, several overall planning constructs have been used to size and structure U.S. forces to include: the 1½ war planning scenario in the 1970s and 1980s, the BUR's two MRCs, and the QDR's "shape/respond/prepare" approach. This working group will address the analytical support that the operations research community can offer to help analyze alternative constructs and evaluate their ability to meet the "macro" planning needs of senior officials. It will take a top-down view of how the analysis can support DoD's broad-based defense planning. It will also explore the strengths and weaknesses of the point scenario approach to force planning.

B. Shape: Chair: Dr. George Akst (CNA)

According to the QDR strategy, the U.S. military must be able to "help shape the international security environment in ways favorable to U.S. national interests." The insertion of the word "help" acknowledges that this is a broad task that involves the cooperative effort of many other U.S. and international agencies. The QDR goes on to further define these shaping activities to include "efforts to promote regional stability, prevent or reduce conflicts and threats, and deter aggression and coercion on a day-to-day basis in many key regions of the world."

The above description leaves a lot of room for interpretation about what to include in the shaping category, and what not to include. The reference to "reducing" conflict implies that shaping can include certain levels and types of conflict. It also infers that it excludes certain levels of conflict (and puts those in the "respond" category). For the purposes of this workshop, we include those conflicts that either arise from an escalation of a predominantly shaping mission, or whose main goal is limited warfare to achieve a certain shaping function. What about humanitarian assistance efforts, such as disaster relief? These can be characterized legitimately as responding, but we include them in this section because a major goal of these operations is also shaping: winning friends and influencing people around the world. After considerable thought, one typically arrives at the conclusion that no set of definitions for shaping (as well as respond and prepare) will be fully satisfactory or provide unequivocal distinctions among these categories. This work group will focus on the two primary categories, forward presence/engagement and small-scale contingencies and operations other than war.

1. Forward Presence/Engagement. Military forces, operating in conjunction with other U.S. and world agencies, will remain engaged in areas of the world in which we have interests. These engagements can take on many forms, including permanent overseas bases in places that we have vital interests such as Europe and Korea; rotational forward presence (Navy carriers and amphibious forces, Air Expeditionary Forces, etc.); exercises with forces of allies and security partners, foreign affairs officers, "mil-to-mil" contacts,

professional military education exchanges; and many other types of interactions. All of these activities help promote regional stability and shape the foreign scene towards adherence to international norms. The operations research community may help in many ways, ranging from cost-benefit tradeoffs among various types of overseas presence, to improving contacts with the operations research communities in other countries. (Chair: Mr. Bruce Powers (N-81), Co-Chair: Mr. Dean Free (N-81))

2. Small-Scale Contingencies and OOTW. One can view the forward presence mission described above as a long-term preventative measure that we take to ensure peace and stability. When this doesn't work to our complete satisfaction, we may have to step in and take further steps to either "keep" the peace or, if that fails, "enforce" the peace. These types of operations are often characterized as small-scale contingencies, or OOTW. Another characterization of these missions is preventative measures and conflict reduction measures. No categorization is likely to be completely satisfactory, but these types of operations include such efforts as: reducing or eliminating NBC capabilities (as has been done with the U.S. and the former Soviet Union, or more aggressively by the UN in Iraq); reducing the production and flow of illegal drugs into the U.S. by military support to joint interagency task forces; providing humanitarian assistance operations, such as earthquake and famine relief; reducing threats to ethnic groups, such as the Iraqi no-fly zones; and bolstering regional stability, to include such recent efforts as Bosnia and Somalia. This session will examine existing and new frameworks for examining the effectiveness of such operations, to include special information and data needs, possible MOEs, and models and simulations. (Chair: Mr. Fred Frostic (Booz-Allen), Co-Chair: Mr. Ken Truett (Booz-Allen))

C. Respond: Chair: COL Greg Parlier (HQ Army, PA&E)

Both the recent Quadrennial Defense Review and the National Defense Panel reaffirmed that U.S. forces must continue to be able to execute the full spectrum of military operations, from deterring adversary aggression and conducting concurrent smaller-scale contingency operations to fighting and winning major theater wars. In order to maximize the ability of QDR 01 to accurately specify the requirements of such a full-spectrum strategy, a three-part framework to identify actions and research is proposed for the Respond Working Group. First, the Combat Operations Subgroup will address the present and future states of that field, focusing on modeling to support the QDR. It will examine areas for improvement and estimate DoD modeling capabilities available for use in QDR 01, along with near-term investment options to enhance those capabilities. Second, the Information Operations Subgroup will identify opportunities that exploit U.S. information dominance, as well as the risks. It will simultaneously identify concepts, models, and measures-of-merit needed to support the acquisition and use of information warfare capabilities. Third, the Asymmetric Challenges Subgroup will examine the threat or use of weapons of mass destruction (WMD) in an asymmetric fashion. The United States must anticipate and confront such threats with a range of actions including declaratory policy, operational concepts for frustrating such attacks, and possible changes in force posture that would both reduce U.S. vulnerabilities and render such policies and

concepts more effective. This work group will focus on the emerging contribution of operations research to these challenges.

1. Combat Operations. Campaign modeling plays a key role in assessing our capabilities to wage war and in evaluating alternative force structures. This subgroup will focus on the present and future state of campaign modeling. As background, it will review the campaign modeling done for the QDR, including DAWMS Parts I and II, the "near peer" analysis done by PA&E, and the TACWAR based analysis led by J-8. It will list major areas where improvement is needed and it will identify and discuss current development efforts (e.g., JWARS). The final product will include an estimate of the likely DoD modeling capabilities available for use in the 2001 QDR, and options for near-term investment to enhance these capabilities. (Chair: COL Forrest Crain (CAA), Co-Chair: LTC Dave Hutchison (Army PA&E))

2. Information Operations. For the foreseeable future, the U.S. will not only be more capable than any possible adversary in the technical use of information to support warfare, but will also be more dependent on its successful use. This creates both opportunities and risks—opportunities to exploit information superiority (or even information dominance) in the battlespace, but risks that attacking information systems may prove to be much cheaper and easier than building and using them. U.S. investments in information operations are running well ahead of the analytical tools available to assess the value of such investments. This subgroup will identify concepts, models, and measures-of-merit needed to support the acquisition and use of information warfare capabilities. (Chair: Mr. Wes Hamm, (MITRE), Co-Chair: Mr. Steve Myers (JHU/APL).

3. Asymmetric Challenges. In the current era, the United States appears dominant against a range of relatively symmetric threats. It therefore seems likely that future adversaries will employ asymmetric strategies when attacking U.S. vulnerabilities. Asymmetric threats could involve weapons of mass destruction (WMD), theater missiles, special forces, terrorism, deep sea mines, diesel submarines, and information warfare. For example, an adversary could threaten or carry out WMD attacks on ports or airfields that are critical to U.S. lines of communication, or threaten U.S. allies in ways which would lead them to deny U.S. access to their ports and airfields. The traditional analysis of deterrence and the nuclear balance developed during the Cold War does not adequately address such threats. This subgroup will explore how these threats change U.S. strategy and force requirements (especially relating to "full-dimensional protection"). It will identify alternative declaratory policies, strategies and operational concepts that respond to such threats together with the U.S. force structures/postures that would make these policies/concepts more effective. (Chair: Dr. Bruce Bennett, (RAND), Co-Chair: Dr. Tom Cedel, (TASC))

D. Prepare: Chair: Col Tom Allen (AFSAA)

Beyond seeking forces robust enough to *respond* to a daunting menu of challenging scenarios and to support our efforts to *shape* our security environment to best meet national needs, we must *prepare* ourselves for an uncertain future going out well beyond a usual programming horizon of a half a dozen years. This is sometimes termed **strategic adaptiveness**. It may start with conventional studies of how we change our present forces of divisions, carrier groups, wings, etc. via modernization (improvements in weapon systems), sizing changes, and new operational concepts, but much more is involved. We may wish to, or be forced to, make drastic changes in the way we fight and/or in the way we organize our forces in order to exploit technological opportunities, cope with geopolitical changes and shifts in alliances, adapt to economic and social fluctuations, recognize the impact of significant demographic changes, etc. This is especially challenging when the changes are so sudden or unexpected and/or so large as to be "shocks."

For purposes of this workshop, we have divided discussion of preparing into the two subgroups described below:

1. Force Modernization. In this era of tight budgets, force modernization decisions are becoming more and more difficult. This session will focus on analyses that support force modernization. It will begin with presentations on the methodologies used in recent analyses (e.g., bomber studies, air/sealift studies, ATACMS II AOA). It will explore how existing analysis can help in the force modernization portion of the QDR. And it will address ways that analysis may help in the modernization versus force size decision. (Chair: Col Tom Allen (AFSAA))

2. Advanced Operational Concepts. The "revolution in military affairs" will become a reality only to the extent that new operational concepts are developed that exploit the possibilities created by new technology. Such operational concepts may involve changes in doctrine, in tactics, in training, and/or in the way forces are structured. This subgroup will focus on the challenge of developing analytical techniques to determine the effectiveness of new operational concepts. It will also address the challenge of drawing lessons from the "experiments" the Services are conducting, and of designing these experiments so that as much as possible can be learned. (Chair: COL B.J. Thornburg (AVCSA, Center for Land Warfare))

E. WORKING GROUP GUIDANCE

Each of the working groups will address the following issues:

- The objectives of analytical work in this arena. In particular, what questions did/can/should a QDR ask that analysis can help to answer?
- Lessons learned in the 1997 QDR regarding requirements, opportunities, and constraints.

- Opportunities to do better in 2001, to include “cutting edge” planning approaches.
- Activities that would be appropriate over the next 2-3 years to enable better support to the next QDR.
 - What tools need to be developed or improved?
 - What data sets need to be compiled?
 - What actions are needed in the near future?

It is anticipated that the break-out sessions will include about 50 percent papers and 50 percent discussion, oriented toward recommendations for the future. However, the above guidance is not rigid or all inclusive. Working groups and subgroups are encouraged to explore any topic that may provide valuable analytical insights relative to the next QDR.

Following the workshop, each working group chair, working with his or her subgroup chairs and co-chairs, will prepare a brief summary of the key ideas emanating from his or her working group. The program chair will then integrate these inputs into a briefing chart-style workshop report. A shorter version of this briefing will be available for presentation at the next symposium and at individual meetings with the sponsors.

Synthesis Group. Chair: Dr. Jacqueline Henningsen, (OSD), Co-chair Dr. Peter Sharfman, (MITRE).

The final session at the workshop will include a presentation by this group that summarizes and integrates the topics discussed in the working groups.

Academic Perspective. Dr. Steven J. Brams, New York University

“Theory of Moves and Fair Division” (1300 – 1500, Thursday)

Future Visions. Dr. Peter Sharfman (MITRE)

- I. Dr. Ashton Carter (Harvard) “Preventative Defense”
- II. MajGen Charles Link (USAF Retired) “Models and Joint Warfighting”
- III. TBD “Army After Next”

Read Ahead

1. NDP Report to Congress
2. QDR Report to Congress

Related Material

- (1) Following are some of the sessions at the 65th MORSS that featured presentations related to the QDR:

Composite Group II –

- RADM Craine, Director Assessment Division, N81, “Navy Response to the Quadrennial Defense Review”

Special Session 1 –

- Mr. Bill Lynn, Director, OSD/PA&E, “The Quadrennial Defense Review”
- Mr. Paul Davis, RAND, “Looking Beyond the QDR: Analytic Insights and Challenges”

Composite Group VI –

- Mr. Lou Finch, DUSD, Readiness, “Resource Issues and Readiness Measures: QDR Assessments and Beyond”

Composite Group VII

- COL Greg H. Parlier, Chief RPAD, OCSA (PAED), “Resourcing the United States Army in an Era of Strategic Uncertainty: QDR Implications for Analysis”

Composite Group – General Interest –

- Mr. John Osterholz, Deputy Director, CISA, OSD, “The Challenges of Analyzing the C4ISR Trade Space for the QDR”
- Mr. Royce Kneece, Office of the Director PA&E, OSD, “Analysis of a Generic Regional Great Power Scenario”
- Dr. Robin Buckelew, Director, Missile Defense Battle Integration Center, “Army QDR Analysis”
- COL Rusty O’Brien, HQ USAF/XO-DAG, “Air Force QDR Analysis”
- CAPT T. J. Gregory, The Joint Staff, J8, “The Baseline Engagement Force Study”

Working Group 6, Littoral Warfare –

CDR Kirk Michealson, OSD/PA&E, “CV Crisis Response (A Study in Support of the QDR”

- (2) “Quick Response Analysis Requirements and Methodologies (GRAM),” MORS Mini-Symposium, 30 September – 3 October 1996.

10 March 1998



Military Operations Research Society

Mini-Symposium and Workshop

QDR ANALYSIS: Lessons Learned and Future Directions

7-9 April 1998

MS Natalie S Addison
MORS
Suite 202
101 S. Whiting Street
Alexandria VA 22304
TELEPHONE:
OFF: DSN:
FAX: (703)-751-8171
Email: morsvpa@aol.com

MAJ Steven M Aviles
US Army Concepts Analysis Agency
8120 Woodmont Ave
Bethesda MD 20814-2797
TELEPHONE:
OFF: (301)-295-5291 DSN: 295
FAX: (301)-295-1662
Email: None

MR Ricardo A Aguilera
US GAO
Room 4015
441 G Street NW
Washington DC 20548
TELEPHONE:
OFF: DSN:
FAX: (202)-512-7981
Email: None

DR George Akst
CAN
4401 Ford Avenue
Alexandria VA 22302-0268
TELEPHONE:
OFF: DSN:
FAX: (703)-824-2264
Email: akstg@cna.org

MR William R Aldridge
SETA Corporation
6862 Elm Street
McLean VA 22101-3833
TELEPHONE:
OFF: (703)-695-1763 DSN: 225-1763
FAX: (703)-693-4601
Email: aldrdw@js.pentagon.mil

COL Ricky R. Ales
HQ USAF/XOCD
1480 Air Force Pentagon
Washington, DC 20330
TELEPHONE:
OFF: (703) 697-9701
FAX: (703) 614-7461
Email: None

COL Thomas L. Allen
AFSAA/CC
1570 Air Force Pentagon
Washington DC 20330-1570
TELEPHONE:
OFF: (703)-695-9046 DSN: 225
FAX: (703)-697-3441
Email: thomas.allen@af.pentagon.mil

Dr Steven M Babin
Johns Hopkins University/APL
Bldg 7, Room 382
11100 Johns Hopkins Road
Laurel MD 20723-6099
TELEPHONE:
OFF: DSN:
FAX: (240)-228-5548
Email: None

MR Lawrence R Bachman
Johns Hopkins University/APL
11100 Johns Hopkins Road
Laurel MD 20723
TELEPHONE:
OFF: DSN:
FAX: (240)-228-6391
Email: None

DR Michael P Bailey
MCCDC
Studies & Analysis Division
3300 Russell Road
Quantico VA 22134
TELEPHONE:
OFF: (703)-784-6084 DSN:
FAX: (703)-784-4917
Email: baileym@quantico.usmc.mil

MAJ Edward D Banta
HQMC (P&R)
CMC (P&R)
HQMC 2 Navy Annex
Washington DC 20380-1775
TELEPHONE:
OFF: DSN:
FAX: (703)-697-9522
Email: None

MR Charles W Barker III
Systems Planning and Analysis
Suite 400
2000 N Beauregard St
Alexandria VA 22311
TELEPHONE:
OFF: DSN:
FAX: (703)-578-5688
Email: None

DR Donald R Barr
US Military Academy
Department of Systems Engineering
Mahan Hall, Bldg 752, 4th Floor
West Point NY 10996-1779
TELEPHONE:
OFF: DSN: 688-4374
FAX: (914)-938-5919
Email: fj8305@trotter.usma.edu

DR Bruce W Bennett
RAND
1700 Main Street
PO Box 2138
Santa Monica CA 90407-2138
TELEPHONE:
OFF: (310)-393-0411 DSN:
FAX: (310)-451-7067
Email: bruce_bennett@rand.org

MR Vernon M Bettencourt Jr FS
ODUSA (OR)
Room 1E643
102 Army Pentagon
Washington DC 20310-0102
TELEPHONE:
OFF: (703)-697-0367 DSN: 227
FAX: (703)-697-7748
Email: bettevm@hqda.army.mil

MR James N Bexfield FS
Institute for Defense Analyses
1801 Beauregard St
Alexandria VA 22311-1772
TELEPHONE:
OFF: DSN: 761-6825
FAX: (703)-578-2813
Email: jbexfield@ida.org

MR Steven M Biemer
Johns Hopkins University/APL
Johns Hopkins Road
Laurel MD 20723
TELEPHONE:
OFF: (301)-953-8605 DSN:
FAX: (301)-953-5910
Email: None

MS Ann Borseth
US GAO
Room 4015
441 G Street
Washington DC 20548
TELEPHONE:
OFF: DSN:
FAX: (202)-512-7981
Email: None

DR Alfred G Brandstein
Marine Corps Combat Development
Command
Studies and Analysis Division
3300 Russell Road
Quantico VA 22134
TELEPHONE:
OFF: (703)-784-3235 DSN: 278
FAX: (703)-784-3547
Email: algebrasmc.

MR Roger A Brown
RAND
Suite 800
1333 H Street
Washington DC 20005
TELEPHONE:
OFF: DSN:
FAX: (202)-296-7960
Email: None

MR William H Brundage
GRCI
STE 300
1225 Jefferson Davis Hwy
Arlington VA 22202
TELEPHONE:
OFF: DSN: 664
FAX: (703)-604-6400
Email: None

DR Robin B. Buckelew
Center for Land Warfare
Room 1D536 DACS-ZC-CLW
200 Army Pentagon
Washington DC 20310-0200
TELEPHONE:
OFF: DSN: 227-6384
FAX: (703)-614-5100
Email: None

MR John G Burton
Systems Planning and Analysis Inc.
Ste 400
2000 N Beauregard St
Alexandria VA 22311-1714
TELEPHONE:
OFF: (703)-578-5617 DSN:
FAX: (703)-578-5690
Email: jgburton@spa.com

DR Peter Bythrow
JHU/APL
Johns Hopkins Road
Laurel, MD 20723
TELEPHONE:
OFF: (240) 228-5286
FAX: (240) 228-6046
Email: Pete_Bythrow@jhuapl.edu

LtCol James R Callard
USAF/XPXQ
Suite 802
901 N Stuart St
Arlington VA 22203
TELEPHONE:
OFF: DSN: 426-7715
FAX:
Email: None

MS Ann M. Campbell
HQDA/Office of the Chief, Army Reserves
Attn: DAAR/PAE
2400 Army Pentagon
Washington, DC 20310-2400
TELEPHONE:
OFF: (703) 695-2342 DSN: 225
FAX: (703) 695-3826
Email: campbell@pentagon.ocar1.army.mil

MR. Ashton B. Carter
Kennedy School of Government
79 J F K Street
Cambridge, MA 02138
TELEPHONE:
OFF: (617) 495-9250
FAX: (617) 495-1405
Email: None

LTC William B Carlton
USMA
Department of Systems Engineering
West Point NY 10996
TELEPHONE:
OFF: (914)-938-5529 DSN:
FAX: (914)-938-5665
Email: fw5058@exmail.usma.edu

MR Gregory A Carter
Northrop Grumman Corporation
8900 E Washington Blvd
MS N402/XA
Pico Rivera CA 90660-3737
TELEPHONE:
OFF: DSN:
FAX: (562)-948-9485
Email: None

MR Thomas E Cedel
TASC
STE 1500
1101 Wilson Blvd
Arlington VA 22209-2248
TELEPHONE:
OFF: DSN:
FAX: (703)-524-6666
Email: TECedel@smtpgate.read.tasc.com

MR William V Chiaramonte
GRCI
STE 300
1225 Jefferson Davis Hwy
Arlington VA 22202
TELEPHONE:
OFF: DSN:
FAX: (703)-604-6400
Email: None

MS Deborah P Christie
IDA
1801 N Beauregard St
Alexandria VA 22311-1771
TELEPHONE:
OFF: DSN:
FAX: (703)-845-2255
Email: None

DR David SC Chu
RAND
1333 H Street NW
Washington DC 20005
TELEPHONE:
OFF: (202)-296-5000 DSN:
FAX: (202)-296-7960
Email: None

MR Gary Coyle
Johns Hopkins University/APL
11100 Johns Hopkins Road
Laurel MD 20723-6099
TELEPHONE:
OFF: DSN:
FAX:
Email: gary.coyle@jhuapl.edu

LTC Michell C Clark
OCSA-PAE-D
TELEPHONE:
OFF: DSN: 223-0506
FAX: (703) 697-8723
Email: None

COL William Forrest Crain
US Army CAA
Attn: Barbara Cork
8120 Woodmont Ave
Bethesda MD 20814-2797
TELEPHONE:
OFF: (301)-295-1581 DSN: 295-1581
FAX: (301)-295-1505
Email: crain@caa.army.mil

MR John J Clifford
Center for Naval Analysis
4401 Ford Avenue
Alexandria VA 22302-1498
TELEPHONE:
OFF: DSN: 761-9638
FAX: 703-824-2857
Email: None

MR E. Patrick Curley
GRCI c/o OSD IMAG
Crystal Gateway 2, Suite 300
1225 Jefferson Davis Highway
Arlington VA 22202
TELEPHONE:
OFF: (703)-604-6349 DSN:
FAX: (703)-604-6400
Email: epcurley@aol.com

DR Terrence R. Colvin
Synergy, Inc
1763 Columbia Rd NW
Washington DC 20009-2834
TELEPHONE:
OFF: (202)-232-6261 DSN:
FAX: (202)-232-8359
Email: tcolvin@synergyinc.com

CAPT Robert B Danberg
COMTRAPAC
Commander Training Command, Pacific
33055 Nixie Way
San Diego CA 92147-5192
TELEPHONE:
OFF: DSN: 524
FAX: (619)-524-1124

DR Scott Comes
OSD PA&E
Naval Forces Div, Room 2D312
1800 Defense Pentagon
Washington DC 20301-1800
TELEPHONE:
OFF: (703)-697-0063 DSN:
FAX: (703)-693-5707

DR Paul K Davis
RAND
PO BOX 2138
1700 Main St
Santa Monica CA 90407-2138
TELEPHONE:
OFF: (310)-393-0411 DSN:
FAX: (310)-451-6942
Email: pdavis@rand.org

MR Paul T Davis
Boeing
M/C 50642233
PO Box 516
St. Louis MO 63166-0516
TELEPHONE:
OFF: DSN:
FAX: 314-233-5125
Email: None

CDR Hampton Dowling
Defense Special Weapons Agency
6801 Telegraph Road
Alexandria VA 22310
TELEPHONE:
OFF: DSN:
FAX: (703)-325-2964
Email: Dowling@hq.dswa.mil

Capt Douglas E. Dudgeon
MCCDC
Studies and Analysis Div
3300 Russell Rd
Quantico VA 22134-5130
TELEPHONE:
OFF: DSN:
FAX: (703)-784-3547
Email: None

DR Stuart G Dunn
Center for Naval Analyses
4401 Ford Ave
PO Box 16268
Alexandria VA 22302-0268
TELEPHONE:
OFF: (703)-824-2694 DSN: 289-2638
FAX:
Email: None

MR David N Dustin
Johns Hopkins University/APL
11100 Johns Hopkins road
Laurel MD 20723-6099
TELEPHONE:
OFF: DSN:
FAX: (240)-228-6391
Email: None

MR David M. Fadeley
JHU/APL
11100 Johns Hopkins Road
Laurel, MD 20723-6099
TELEPHONE:
OFF: (240) 228-5497
FAX: (240) 228-5467
Email: None

MR Evan M Farris
Systems Planning & Analysis, Inc.
Suite 400
2000 N Beauregard St
Alexandria VA 22311-1712
TELEPHONE:
OFF: (703)-578-5667 DSN:
FAX: (703)-578-5688
Email: efarris@spa.com

MR Christopher E Feeney
SAIC
MS 1-10-1
1710 Goodridge Drive
McLean VA 22102
TELEPHONE:
OFF: DSN: 224-9141
FAX: (703)-695-6903
Email: None

MR Francis A Finelli
Office of Senator Coats
Russell Office Building
Room 404
Washington DC 20510
TELEPHONE:
OFF: (202)-224-8731 DSN:
FAX: (202)-228-4745
Email: None

MR. Michael P Fischerkeller
Institute for Defense Analyses
1801 N Beauregard St
Alexandria VA 22311-1772
TELEPHONE:
OFF: DSN:
FAX: (703)-370-0797
Email: None

MS Michele A Flournoy
OASD/S&TR
Room 4B724
2900 Defense Pentagon
Washington DC 20301-2900
TELEPHONE:
OFF: DSN:
FAX: (703)-614-0400
Email: None

MR Thomas R Foard
Johns Hopkins University/Applied Physics Lab
Johns Hopkins Road
Laurel MD 20723
TELEPHONE:
OFF: DSN:
FAX:(240)-228-5910
Email: None

MR W. Dean Free
Chief of Naval Operations (N812D)
2000 Navy Pentagon
Washington DC 20350-2000
TELEPHONE:
OFF: (703)-614-9130 DSN: 224-9130
FAX: (703)-695-6903
Email: free.dean@hq.navy.mil

MS Vanda T Freeman
Johns Hopkins University/APL
1E-181
Johns Hopkins Rd
Laurel MD 20723-6099
TELEPHONE:
OFF: (301)-953-6838 DSN:
FAX:
Email: None

MR Steven M. Friedman
Veridian, Veda
Suite 200
5200 Springfield Pike
Dayton, OH 45431
TELEPHONE:
OFF: (937) 253-4770
FAX: (937) 476-2900
Email: sfriedman.dythn@dytn.veridian.com

MR Mark D Frost
Booz Allen & Hamilton
8283 Greensboro Drive
McLean VA 22102-3838
TELEPHONE:
OFF: (703)-902-5594 DSN:
FAX: (703)-902-3393
Email: frost_mark@bah.com

MR Frederick L Frostic
Booz Allen & Hamilton
8283 Greensboro Drive
McLean VA 22102-3838
TELEPHONE:
OFF: 703-917-2878 DSN:
FAX: (703)-902-3392
Email: frostic_fred@bah.com

MR Thomas L Gibson
OSD(PA&E)
Director, Naval Forces Division
1800 Defense Pentagon, #2D312
Washington DC 20301-1800
TELEPHONE:
OFF: DSN:
FAX: (703)-693-5707
Email: None

DR J. Michael Gilmore
OSD(PA&E)
Deputy Director, General Purpose Program
1800 Defense Pentagon, Room 2E330
Washington DC 20301-1800
TELEPHONE:
OFF: (703)-695-0528 DSN: 225
FAX: (703)-693-5707
Email: gilmorej@paesmt.pae.osd.mil

MR Russell E Gingras
Johns Hopkins University/APL
Johns Hopkins Road
Laurel MD 20723
TELEPHONE:
OFF: DSN:
FAX: (240)-228-5910
Email: russell.gingras@jhuapl.edu

MR Andrew C Good
Johns Hopkins University/APL
11100 Johns Hopkins Road
Laurel MD 20723-6099
TELEPHONE:
OFF: DSN:
FAX: (240)-228-6198
Email: None

DR Jeffrey H Grotte
Institute for Defense Analyses
1801 N Beauregard St
Alexandria VA 22311
TELEPHONE:
OFF: (703)-845-2165 DSN:
FAX: (703)-845-2255
Email: jgrottada.org

MR Milton Gussow
Johns Hopkins University/APL
Johns Hopkins Road
Laurel MD 20723-6099
TELEPHONE:
OFF: (301)-953-5160 DSN:
FAX: (301)-953-5910
Email: gussow@jhuapl.edu

MR Paul Gvoth
US General Accounting Office
Suite 300
5029 Corporate Woods Drive
Virginia Beach VA 23462
TELEPHONE:
OFF: DSN:
FAX: (757)-490-3045
Email: None

MR Robert H. Halayko
Joint Staff J8/SAGD
The Pentagon, Room BC942
Washington, DC 20318-8000
TELEPHONE:
OFF: (703) 693-4600 DSN: 223
FAX: (703) 693-9389
Email: halaydrh@js.pentagon.mil

DR Ralph A Hallenbeck
SAIC
MS 1-8-3
1710 Goodridge
McLean VA 22102
TELEPHONE:
OFF: DSN:
FAX: (703)-821-1037
Email: ralph.a.hallenbeck.iii@cpmx.saic.com

MR Wesley L Hamm
The MITRE Corporation
1820 Dolley Madison Blvd
McLean VA 22102-3481
TELEPHONE:
OFF: (703)-883-6403 DSN:
FAX: (703)-883-1379
Email: whamm@mitre.org

MR Paul D Hardy
JHU/APL
11100 Johns Hopkins Rd
Laurel MD 20723-5099
TELEPHONE:
OFF: DSN:
FAX: (240)-228-5790
Email: None

DR Dean S Hartley III
Data Systems R&D Program
1099 Commerce Park
Oak Ridge TN 37830
TELEPHONE:
OFF: (423)-574-7670 DSN:
FAX: (423)-574-0792
Email: dhx@ornl.gov

MR Frederick E Hartman
Foxhall Group
1620 Foxhall Road
Washington DC 20007-2029
TELEPHONE:
OFF: (202)-298-7166 DSN:
FAX: (202)-338-4279
Email: hartmanfe@aol.com

MR Heide E Heidepriem
Johns Hopkins University/APL
Room 13-N424
11100 Johns Hopkins Road
Laurel MD 20723-6099
TELEPHONE:
OFF: DSN:
FAX: (240)-228-5910
Email: heide.heidepriem@jhuapl.edu

LTC Darrall R Henderson
HQ USSOCOM
SORR-SCA
7701 Tampa Point Blvd
MacDill AFB FL 33621
TELEPHONE:
OFF: (813)-828-8951 DSN: 968
FAX: (813)-828-3880
Email: henderso@hqsocom.af.mil

DR Jacqueline R. Henningsen FS
OSD PA&E
Regional Assessment and Modeling Div
1800 Defense Pentagon #2C270
Washington DC 20301-1800
TELEPHONE:
OFF: (703)-697-0584 DSN: 227-0564
FAX: (703)-695-7988
Email: henningj@paesmt.pae.osd.mil

DR Richard J Hillestad
RAND
1700 Main St
PO Box 2138
Santa Monica CA 90407-2138
TELEPHONE:
OFF: (310)-393-0411 DSN:
FAX: (310)-393-4818
Email: hillestad@rand.org

MR James Hillman
JHU/APL
Johns Hopkins Road
Laurel, MD 20707
TELEPHONE:
OFF: (240) 228-5000
FAX: (240) 228-5284
Email: James.Hillman@jhuapl.edu

DR Wade P Hinkle
Institute for Defense Analyses
Strategy, Forces and Resources Div
1801 N Beauregard St
Alexandria VA 22311-1772
TELEPHONE:
OFF: (703)-578-2895 DSN:
FAX: (703)-845-2255
Email: whinkl@ida.org

MR James C Hoffman
SETA Corporaton
JCS/J8/JWAD Pentagon
Washington DC 20318-8000
TELEPHONE:
OFF: (703)-697-9347 DSN: 227-9847
FAX: (703)-614-4141
Email: hoffmajc@js.pentagon.mil

DR Gary E Horne
MCCDC - CNA Field Analyst
Studies & Analysis Division (C45)
3300 Russell Road
Quantico VA 22134-5130
TELEPHONE:
OFF: (703)-784-6007 DSN: 278
FAX: (703)-784-3547
Email: horneg1@quantico.usmc.mil

LTC David W Hutchison
OCSA-PAED
The Pentagon, Room 1D687
Washington DC 20310
TELEPHONE:
OFF: (703)-695-0506 DSN: 223-0506
FAX: (703)-697-8123
Email: hutchdw@pentagon-paed.army.mil

MS Susan M Iwanski
Northrop Grumman Corporation
Advanced Tech & Devel Ctr MS-C63-05
South Oyster Bay Road
Bethpage NY 11714-3580
TELEPHONE:
OFF: (516)-346-9138 DSN:
FAX: (516)-346-9740
Email: sue_iwanski@atdc.northgrum.com

MR Joseph C Jenkins
Madison Research Corp
401 Wynn Drive
Huntsville AL 35805
TELEPHONE:
OFF: (256)-864-7253 DSN:
FAX: (256)-864-7287
Email: jjenkins@madisonresearch.com

ADM David E Jeremiah
Technology Strategies & Alliances
5242 Lyngate Court
Burke VA 22015
TELEPHONE:
OFF: DSN:
FAX: (703)-425-8839
Email: None

MS Cynthia Kee LaFreniere
Military Operations Research Society
#202
101 S Whiting St
Alexandria VA 22304
TELEPHONE:
OFF: (703)-751-7290 DSN: 484-7714
FAX: (703)-751-8171
Email: morscyn@aol.com

DR George E Koleszar
IDA
1801 N. Beauregard Street
Alexandria VA 22311
TELEPHONE:
OFF: DSN:
FAX: (703)-845-6722
Email: None

DR Jerry A Kotchka
Boeing Phantom Works
Mail Code 0641251
PO Box 516
St. Louis MO 63166-0516
TELEPHONE:
OFF: (314)-777-9990 DSN:
FAX: (314)-232-7917
Email: Jerry.A.Kotchka@boeing.com

MR William J Krondak
TRADOC Analysis Center
Attn: ATRC-SW
255 Sedgwick Ave
Fort Leavenworth KS 66027-2345
TELEPHONE:
OFF: (913)-684-9120 DSN: 552
FAX: (913)-684-9109
Email: krondakw@trac.army.mil

MAJ James T. Kuhn
MCU
MCCDC
2076 South Street
Quantico, VA 22134-9801
TELEPHONE:
OFF: (703) 784-5860 DSN: 278
FAX: (703) 784-5916
Email: None

MR Rob Kurz
Booz, Allen, & Hamilton
8283 Greensboro Drive
McLean VA 22102
TELEPHONE:
OFF: DSN:
FAX:
Email:

VADM Conrad C. Lautenbacher Jr.
OPNAV N8
2000 Navy Pentagon
Washington DC 20350
TELEPHONE:
OFF: DSN:
FAX:
Email: None

MR Kenneth E Lavoie
Air Force Wargaming Center
AUCADRE/WGA
401 Chennault Cir
Maxwell AFB AL 36112-6428
TELEPHONE:
OFF: DSN: 493-1289
FAX: (334)-953-2111
Email: lavoie@afwc.af.mil

MR John P. Lawrence
SAIC
1710 Goodridge Drive
McLean, VA 22102
TELEPHONE:
OFF: (703) 749-8637
Email: None

MR Michael Leonard
IDA
1801 N. Beauregard Street
Alexandria VA 22311
TELEPHONE:
OFF: DSN:
FAX: (703)-845-2255
Email: mleonard@ida.org

MR Berlin K Lewis
US Army Land Information Warfare Activity
Suite 404
5111 Leesburg Pike
Falls Church VA 22041
TELEPHONE:
OFF: DSN: 761-6359
FAX: (703)-681-3437
Email: None

DR Leslie K Lewis
RAND
Suite 800
1333 H Street, NW
Washington DC 20005
TELEPHONE:
OFF: (202)-296-5000 DSN: 296-5348
FAX: (202)-296-7960
Email: None

MajGen Charles D Link USAF, Ret
SAIC
1710 Goodridge Drive
McLean VA 22102
TELEPHONE:
OFF: DSN:
FAX: (703)-448-5730
Email: None

COL Andrew G Loerch
HQ, Department of the Army
DAMO-FDX
400 Army Pentagon (3D443)
Washington DC 20310-0400
TELEPHONE:
OFF: (703)-695-4485 DSN:
FAX:
Email: loercan@fdxpo.army.mil

MAJ Peter F Long
HQMC, P&R
Program and Resources
TELEPHONE:
OFF: (703)-697-9582 DSN: 227
FAX: (703)-697-5329
Email: oonzp@hqi.usmc.mil

Dr Philippe Loustanau
Systems Planning and Analysis, Inc
Suite 400
2000 N Beauregard St
Alexandria VA 22311-1712
TELEPHONE:
OFF: DSN:
FAX: (703)-578-5690
Email: None

LTC Ralph J Masi
HQDA, ODCSPER
DACS-DPR
200 Army Pentagon
Washington DC 20310
TELEPHONE:
OFF: DSN: 227-8723
FAX: (703)-697-8723
Email: None

RADM Michael McDevitt USN, Ret
Center for Naval Analyses
4401 Ford Avenue
PO Box 16268
Alexandria VA 22302-8268
TELEPHONE:
OFF: DSN:
FAX:
Email: mcdevitm@can.org

MR Jimmie McEver
RAND Corporation
1700 Main St
PO Box 2138
Santa Monica CA 90407
TELEPHONE:
OFF: DSN:
FAX: (310)-451-7073
Email: None

MR John R McGarahan
SETA Corporation
6862 Elm Street
McLean VA 22101-3833
TELEPHONE:
OFF: (703)-697-1113 DSN:
FAX: (703)-693-4601
Email: mcgarrrj@js.pentagon.mil

LtCol Stephen J McNamara
HQ USAF/XOJS
1480 Air Force Pentagon
Washington DC 20330
TELEPHONE:
OFF: DSN: 227-8940
FAX: (703)-697-9638
Email: None

Dr David L McNicol
OSD/PA&E
Room 2E314
1800 Defense Pentagon
Washington DC 20301-1800
TELEPHONE:
OFF: DSN:
FAX: (703)-693-4011
Email: None

CDR Kirk A Michealson
OSD PA&E
Naval Forces Div, Room 2D312:
1800 Defense Pentagon
Washington DC 20301-1800
TELEPHONE:
OFF: DSN: 227-0064
FAX: (703)-693-5707
Email: None

MR Richard L Miller
Johns Hopkins University/APL
JWAD, Room 13N407
Johns Hopkins Road
Laurel MD 20723-6099
TELEPHONE:
OFF: DSN:
FAX: 240-228-5910
Email: Richard.Miller@jhuapl.edu

MS Carroll Schmidt Mitchell
DISA
D83
3701 N Fairfax Dr
Arlington VA 22203-1713
TELEPHONE:
OFF: (703)-696-9181 DSN:
FAX: (703)-696-1963
Email: schmidt@c@ncrdisa.mil

MR Richard P Morris
The Boeing Company
Suite 800
1300 Wilson Blvd
Arlington VA 22209
TELEPHONE:
OFF: (703)-526-2603 DSN:
FAX: (703)-526-2469
Email: richard.p.morris@boeing.com

MR Stephen E Myers
Johns Hopkins University/APL
11100 Johns Hopkins Rd
Laurel MD 20723-6099
TELEPHONE:
OFF: DSN:
FAX: (240)-227-5910
Email: stephen.myers@jhuapl.edu

MR Rex E Nelsen
GRC International
SAC Suite 300
1401 Wilson Blvd
Arlington VA 22209-2306
TELEPHONE:
OFF: (703)-696-9366 DSN: 227-0969
FAX: (703)-696-9394
Email: rnelsen@grci.com

MAJ Valentin Novikov
The Joint Staff, J-8
Room 1D964
The Pentagon
Washington DC 20318-8000
TELEPHONE:
OFF: DSN: 227-0557
FAX: (703)-693-3776
Email: None

MR James R. O'Brien
AB Technologies
1901 N. Beauregard Street
Alexandria, VA 22311-1705
TELEPHONE:
OFF: (703) 575-3286
FAX: (703) 998-1625
Email: None

David A. Ochmarek
RAND
1333 H Street NW
Washington, DC 20005
TELEPHONE:
OFF: (202) 296-5000 DSN:
FAX: (202) 296-7960
Email: None

MR Samuel Packer
IDA
1801 N Beauregard St
Alexandria VA 22311
TELEPHONE:
OFF: DSN:
FAX: (703)-845-6977
Email: None

DR Peter P. Pandolfini
Johns Hopkins University/APL
11100 Johns Hopkins Road
Laurel MD 20723
TELEPHONE:
OFF: DSN:
FAX: (240)-228-5910
Email: None

MS Susan Parker
MITRE
W635
1820 Dolley Madison Blvd
McLean VA 22102
TELEPHONE:
OFF: DSN:
FAX: (703)-883-5963
Email: None

COL Greg H Parlier
OCSA PA&E
Attn: DACS-DPR
The Pentagon, Room 3C669
Washington DC 20310
TELEPHONE:
OFF: (703)-695-0510 DSN: 223
FAX: (703)-697-8723
Email: parligh@hqda.army.mil

COL Richard C. Payne
ODCSDOC
Future Battle Directorate
Fort Monroe, VA 23651
TELEPHONE:
OFF: (757) 727-2805 DSN:
FAX:
Email: None

MR Richard G Payne
US General Accounting Office
Suite 300
5029 Corporate Woods Drive
Virginia Beach VA 23462
TELEPHONE:
OFF: DSN:
FAX: (757)-490-3045
Email: None

MajGen Donald L. Peterson
HQ UFAF/AXO
1630 Air Force Pentagon
Washington, DC 20330-1630
TELEPHONE:
OFF: (703) 697-9881 DSN: 227
FAX: (703) 693-1625
Email: None

MAJ Robert G. Phelan Jr
US Army Artificial Intelligence Center
Room 1D659
107 Army Pentagon
Washington, DC 20310
TELEPHONE:
OFF: (703) 614-6909 DSN: 224
FAX: (703) 614-6908
Email: bphelan@pentagon-cnc.army.mil

MR Michael L Poumade
GRC International Inc
1900 Gallows Rd
Vienna VA 22182
TELEPHONE:
OFF: (703)-506-5000 DSN: 000-0664
FAX: (703)-556-4261
Email: pnmt24a@prodigy.com

MR Bruce Powers
Office Chief of Naval Operations (N81)
N812
2000 Navy Pentagon
Washington DC 20350-2000
TELEPHONE:
OFF: (703)-697-7180 DSN: 227
FAX: (703)-693-9760
Email: powers.bruce@hq.navy.mil
LTC Terry W Prosser
JWARS
Crystal Square Four, Suite 100
1745 Jefferson Davis Highway
Arlington VA 22202
TELEPHONE:
OFF: (703)-602-2917 DSN: 332-2918
FAX: (703)-602-3388
Email: prossert@paesmtp.pae.osd.mil

MR Ian Dennis Rapport
Johns Hopkins University/APL
11100 Johns Hopkins Road
Laurel MD 20723-6099
TELEPHONE:
OFF: (240)-228-5093 DSN:
FAX: (240)-228-5762
Email: ian.rapport@jhuapl.edu

DR Roy E Rice
Teledyne Brown Engineering
Cummings Research Park
PO Box 070007
Huntsville AL 35807-7007
TELEPHONE:
OFF: (205)-726-2038 DSN:
FAX: (205)-726-2241
Email: roy_rice@pobox.tbe.com

MR James G. Roche
Northrop Corporation
Orgn: 100/CC, 18th Floor
1840 Century Park East, Century City
Los Angeles CA 90067-2199
TELEPHONE:
OFF: (213)-201-3222 DSN:
FAX: (213)-201-3023
Email: None

LTC William H Roegge
OASD(S&TR)/Strategy
Room 4B724
2900 Defense Pentagon
Washington DC 20301-2900
TELEPHONE:
OFF: DSN:
FAX: (703)-614-0400
Email: None

MR Jeffrey V Rogers
NOESIS, Inc
STE 900
4200 Wilson Blvd
Arlington VA 22203-1800
TELEPHONE:
OFF: DSN: 223-4602
FAX: (703)-693-4601
Email: None

COL Richard G. Sayre
HQ OPTEC
4501 Ford Avenue
Alexandria, VA 22302-1458
TELEPHONE:
OFF: (703) 681-9220
FAX: (703) 681-0625
Email: None

LtCol William A Sawyers
MCCDC
Studies & Analysis Division (C45)
3300 Russell Road
Quantico VA 22134-5130
TELEPHONE:
OFF: (703)-784-6006 DSN: 278-3235
FAX: (703)-784-3597
Email: sawyersw@quantico.usmc.mil

MR Gary W Schnurpusch
SPA, Inc.
STE 400
2000 N Beauregard St
Alexandria VA 22311-1811
TELEPHONE:
OFF: DSN:
FAX: (703)-931-9254
Email: gschnurp@spa.com

DR John Y Schrader
RAND
Suite 800
1333 H Street, NW
Washington DC 20005-4792
TELEPHONE:
OFF: (202)-296-5000 DSN:
FAX: (202)-296-7960
Email: schrader@rand.org

MR Larry Seaquist
The Strategy Group
Suite 904
1280 21st St NW
Washington DC 20036
TELEPHONE:
OFF: DSN:
FAX:
Email: None

DR Robert S Sheldon
S3I
Suite 310
1700 Diagonal Road
Alexandria VA 22314
TELEPHONE:
OFF: DSN:
FAX: (703)-684-8272
Email: bsi.com

DR Peter J Sharfman
The MITRE Corporation
1820 Dolley Madison
McLean VA 22102
TELEPHONE:
OFF: (703)-883-7774 DSN:
FAX: (703)-883-6190
Email: sharfman@mitre.org

MR Mark Siemer
Systems Planning and Analysis
Suite 400
2000 N Beauregard St
Alexandria VA 22311
TELEPHONE:
OFF: DSN:
FAX:
Email: None

MS Elaine R. Simmons
GRC/IMAG,OD (PA&E)
Suite 200
1225 Jefferson Davis Hwy
Arlington, VA 22202-4301
TELEPHONE:
OFF: (703) 604-6358
FAX: (703) 414-1904
Email:

Capt William N Slavik
S&A Division (MCCDC)
3300 Russell Road
Quantico VA 22134-5130
TELEPHONE:
OFF: (703)-784-6017 DSN: 278
FAX: (703)-784-3347
Email: slavikw@quantico.usmc.mil

MR Jeffrey H Smart
JHU/APL
Room 8-308
Johns Hopkins Road
Laurel MD 20723-6099
TELEPHONE:
OFF: DSN:
FAX: (443)-778-6908
Email: None

DR Gordon C. Smith
The Boeing Corporation Washington Studies &
Analysis
Suite 1299
1745 Jefferson Davis Hwy
Arlington VA 22202
TELEPHONE:
OFF: (703)-412-6899 DSN:
FAX: (703)-412-6877
Email: None

MR Gordon D Smith
Johns Hopkins University/APL
1100 Johns Hopkins Road
Laurel MD 20723
TELEPHONE:
OFF: DSN:
FAX: (240)-228-5954
Email: None

MR Edward A. Smyth
Johns Hopkins University/APL
JWAD 13 N407
Johns Hopkins Road
Laurel MD 20723-6099
TELEPHONE:
OFF: (240)-228-6342 DSN:
FAX: (443)-778-5910
Email: ted.smyth@jhuapl.edu

DR Cyrus J. Staniec
Logicon
2100 Washington Blvd
Arlington VA 22204-5706
TELEPHONE:
OFF: (703)-312-2031 DSN:
FAX: (703)-312-2780
Email: cstaniec@logicon.com

MR Steven G Starnier
Booz Allen & Hamilton
8283 Greensboro Drive
McLean VA 22102-3838
TELEPHONE:
OFF: DSN:
FAX: (703)-902-3392
Email: sstarnier@msis.dmsomil

DR Stuart H Starr
The MITRE Corporation
1820 Dolley Madison Blvd #MS W557
McLean VA 22102
TELEPHONE:
OFF: (703)-883-5494 DSN:
FAX: (703)-883-1373
Email: starr@mitre.org

LtGen Martin R Steele
HQMC
Deputy Chief of Staff for Plans, Policy and
Operations
Washington DC 20380-0001
TELEPHONE:
OFF: DSN:
FAX: (703)-695-7194
Email: None

MR William K Stevens
Metron, Inc
Suite 301
512 Via de la Valle
Solana Beach CA 92075
TELEPHONE:
OFF: DSN:
FAX: (619)-792-2719
Email: None

MAJ Michael J Stehlik
DACS-DPR
Room 3C669
200 Army Pentagon
Washington DC 20310
TELEPHONE:
OFF: DSN: 223-0506
FAX: (703)-697-8723
Email: None

Capt Theodore M Strycharz
MCCDC
S&A Division
3300 Russell Rd
Quantico VA 22134-5130
TELEPHONE:
OFF: (703)-784-3235 DSN: 278
FAX: (703)-784-3546
Email: strycharzt@quantico.usmc.mil

MR John D Sullivan Jr
The Boeing Company Washington Studies &
Analysis
Suite 1200
1745 Jefferson Davis Hwy
Arlington VA 22202
TELEPHONE:
OFF: (703)-412-6893 DSN:
FAX: (703)-412-6877
Email: None

MR Sanford S Terry
GRCI
1900 Gallows Road
Vienna VA 22182
TELEPHONE:
OFF: DSN:
FAX: (703)-604-6400
Email: None

MR Donald W Theune
Virtual Technology Corp
6862 Elm Street
McLean VA 22101-3833
TELEPHONE:
OFF: (703)-658-7943 DSN:
FAX: (703)-658-7057
Email: dtheune@seta.com

MR Clayton J Thomas FS
AFSAA/SAN
Rm 1E387
1570 Air Force Pentagon
Washington DC 20330-1570
TELEPHONE:
OFF: (703)-697-4300 DSN: 227
FAX: (703)-697-3441
Email: thomasc@afsaa.hq.af.mil

DR James S Thomason
Institute for Defense Analyses
Strategy, Forces & Resources Div #500
2001 N Beauregard
Alexandria VA 22311
TELEPHONE:
OFF: (703)-845-2480 DSN:
FAX: (703)-845-2255
Email: jthomasoda.org

MS Betty Ann Thompson
MITRE Corporation
1820 Dolley Madison Blvd
McLean VA 22102
TELEPHONE:
OFF: DSN:
FAX: (703)-883-5491
Email: None

COL Bobby J Thornburg
HQDA, AVCSA
Center for Land Warfare DACS-ZC-COW
200 Army Pentagon, Room 1D536
Washington DC 20310-0200
TELEPHONE:
OFF: DSN:
FAX: (703)-614-5100
Email: Thornbj@hqda.army.mil

MAJ Mark E Tillman
Joint Staff J-8
Pentagon Room 1D940
J-8 The Pentagon
Washington DC 20318-8000
TELEPHONE:
OFF: (703)-697-1113 DSN: 227-1118
FAX: (703)-693-4601
Email: tillmame@js.pentagon.mil

MR Donald C Tison
OD/PA&E/FICA
Room 2D278
1800 Defense Pentagon
Washington DC 20301-1800
TELEPHONE:
OFF: DSN: 225-4177
FAX: (703)-693-4011
Email: tisoncd@paesmt.pae.osd.mil

MS Lynda Tonus
HQ USSOCOM
Attn: SOJ7-CS
7701 Tampa Point Blvd
MacDill AFB FL 33621-5323
TELEPHONE:
OFF: (813)-828-7705 DSN: 968
FAX: (813)-878-3880
Email: None

MR Ronald J. Trees
GRC International
Suite 300
1401 Wilson Blvd
Arlington VA 22209
TELEPHONE:
OFF: (703)-696-9366 DSN: 426
FAX
Email: rtrees@grci.com

MR Vincent C Truett
Booz Allen & Hamilton
Allen Bldg
8283 Greensboro Dr
McLean VA 22102-3838
TELEPHONE:
OFF: DSN:
FAX: (703)-902-3392
Email: truett_vince@bah.com

MR Joseph E Turcheck
Systems Planning & Analysis
Suite 400
2000 N. Beauregard Street
Alexandria VA 22311-1714
TELEPHONE:
OFF: DSN:
FAX:
Email: None

DR Donald J. Van Arman
The MITRE Corporation
1820 Dolly Madison
MS W528
McLean VA 22102
TELEPHONE:
OFF: (703)-883-7639 DSN:
FAX: (703)-883-7816
Email: DVA@MITRE.ORG

LtGen Paul K Van Riper (Ret)
TELEPHONE:
OFF: DSN:
FAX:
Email: None

LtCol Brian M Waechter
The Joint Staff (J8)
Room 1D929
8000 Joint Staff Pentagon
Washington DC 20318-8000
TELEPHONE:
OFF: DSN: 223-4607
FAX: (703)-693-4607
Email: bmwaecht@js.pentagon.mil

GEN Larry D Welch (Ret)
Institute for Defense Analyses
1801 N. Beauregard Street
Alexandria VA 22311
TELEPHONE:
OFF: (703)-845-2569 DSN:
FAX:
Email: None

MG Gary F Wheatley (Ret)
Evidence Based Research, Inc
1595 Spring Hill Rd #330
Vienna VA 22182-2228
TELEPHONE:
OFF: DSN:
FAX: (703)-821-7742
Email: wheatley@ebrinc.com

MR Richard I Wiles
Military Operations Research Society
101 S Whiting St #202
Alexandria VA 22304
TELEPHONE:
OFF: (703)-751-7290 DSN: 303-8339
FAX: (703)-751-8171
Email: morsone@aol.com

LTC Victor J Young
Joint Staff/J-8
J-8/ WAD
8000 JOINT STAFF
WASHINGTON DC 20318-8000
TELEPHONE:
OFF: 703-693-3248 DSN:
FAX: (703)-325-6389
Email: young@jj.pentagon.mil

LTC Mark A Youngren
Naval Postgraduate School
Code OR/Ym
Monterey CA 93943
TELEPHONE:
OFF: DSN: 878-2251
FAX: (408)-656-2595
Email: myoungren@wposmtp.nps.navy.mil

Robin B. Buckelew
Director, Center for Land Warfare

Dr. Robin B. Buckelew, a member of the President's Senior Executive Service, is the director of the Center for Land Warfare, Office of the Assistant Vice Chief of Staff of the Army. She is currently responsible for conducting and coordinating all follow-on analytic and visualization support for Army responses to the National Defense Panel's Alternative Force Structure Assessment. Her scope of duties also include preparation for the next Defense review, and the development of wargames, analyses and simulation efforts at the Army's Warfighter Analysis and Integration Center in Arlington, VA.

From 1995 until October 1996, Dr. Buckelew was the director of the Missile Defense Battle Integration Center, an organization she founded within the US Army Space and Strategic Defense Command (USASSDC). In this position, she was responsible for the command's Theater Missile Defense integration and National Missile Defense analyses. She directed the development of large-scale distributed weapon system simulations and synthetic battlefield environments and supervised the Extended Air Defense Testbed Product Office. Her center included highly capable simulation and analysis facilities, among them the Advanced Research Center in Huntsville, Ala., and the Warfighter Analysis and Integration Center.

From January 1993 to January 1995, she was the director of USASSDC's Engineering and Systems Directorate. In that position she was responsible for the command's systems analysis, systems simulation, computer resources, systems engineering and functional/specialty engineering, including provision of a large portion of the matrix support required by the Program Executive Office, Missile Defense.

During 1991-1992, she was chief engineer and head of Project Engineering for the High Endoatmospheric Defense Interceptor (HEDI) Project Office. As the principal technical expert for the project, she was also responsible for acquisition planning, interface with the user, and interceptor based systems issues.

From 1988 to 1991, Buckelew managed the Ground Based Interceptor Experiment (GBI-X) program from its inception through the successful conclusion of the GBI-X procurement, a \$500 million, ground-based, exoatmospheric defensive interceptor.

Dr. Buckelew began federal service as a summer aid for NASA in 1966. She was a cooperative education student for the US Army Missile Command (MICOM) at Redstone Arsenal, Ala. from 1967 to 1969, and worked for MICOM as an aerospace engineer from 1970 to 1974. At that time, she began work in the US Army Missile Intelligence Agency, analyzing Soviet missile guidance, control and performance, subsequently becoming the SA-8 systems engineer.

She joined the Ballistic Missile Defense Systems Command, one of USASSDC's predecessors, as an air vehicle engineer and group leader in the Sentry Project Office. From 1983 to 1988, Buckelew served on the High Endoatmospheric Defense Systems (HEDS) task force and soon became Chief, Air Vehicle Division.

Buckelew has authored many technical papers and studies and has received numerous awards, including the Superior Civilian Service Award, the Meritorious Civilian Service Award, the National Society of Professional Engineers (NSPE) Engineer of the Year award for USASSDC, the Federal Women's Program Outstanding Career Achievement Award, the University of Alabama in Huntsville (UAH) Award for Highest Graduate Academic Achievement, University of Alabama Distinguished Engineering Fellow - 1993 and the UAH Outstanding Alum for 1996. During 1995, she was selected for induction to the Alabama Engineering Hall of Fame, the first female engineer ever to be selected for this prestigious honor.

She is a licensed professional engineer in the state of Alabama and was the District Four Director of the Capstone Engineering Society. She is a former member of the American Institute of Aeronautics and Astronautics (AIAA) Missile Systems Technical Committee (1993). Dr. Buckelew is an Associate Fellow of the AIAA and has been inducted into Sigma Xi, the Scientific Research Society.

Dr. Buckelew was born in York, PA. She has a bachelor of science degree in aerospace engineering from the University of Alabama in Tuscaloosa, a master's degree in mechanical engineering from UAH, and a Ph.D. in engineering from UAH.

She and her husband William P. Buckelew are the parents of two grown children.

Current as of February 1998

The Honorable Ashton B. Carter
HARVARD UNIVERSITY
KENNEDY SCHOOL OF GOVERNMENT

Kennedy School of Government
Ford Foundation Professor
of Science and International Affairs

79 John F Kennedy Street
Cambridge, Massachusetts 02138
Telephone: 617-495-1405
Telefax: 627-495-8963
e-mail: Ashton_Carter@Harvard.EDU

Ash Carter is Ford Foundation Professor of Science and International Affairs at Harvard University's John F. Kennedy School of Government and co-director with William J. Perry, of the Harvard-Stanford Preventive Defense Project. From 1993-1996 Carter served as Assistant Secretary of Defense for International Security Policy, where he was responsible for national security policy concerning the states of the former Soviet Union (including their nuclear weapons and other weapons of mass destruction), arms control, countering proliferation worldwide and oversight of the US nuclear arsenal and missile defense programs; he also chaired NATO's High Level Group. He was twice awarded the Department of Defense Distinguished Service medal, the highest award given by the Pentagon. Carter continues to serve DoD as an adviser to the Secretary of Defense and as a member of both DoD's Defense Policy Board and Defense Science Board. Before his government service, Carter was director of the Center for Science and International Affairs in the Kennedy School of Government at Harvard University and chairman of the editorial board of *International Security*. Carter received bachelor's degrees in medieval history and in physics from Yale University and a doctorate in theoretical physics from Oxford University, where he was a Rhodes Scholar. In addition to authoring numerous scientific publications and government studies, Carter was an author and editor of a number of books, including *Soviet Nuclear Fission: Control of the Nuclear Arsenal in a Disintegrating Soviet Union* (1991); *Beyond Spinoff: Military and Commercial Technologies in a Changing World* (1992); and *Cooperative Denuclearization: From Pledges to Deeds* (1993).

Carter's research focuses on the Preventive Defense Project, which he co-directs with former Secretary of Defense, William J. Perry. The project designs and promotes security policies aimed at preventing the emergence of major new threats to the United States

David S.C. Chu

David S.C. Chu was born in New York City on May 28, 1944, and was educated at Yale University. He received his BA in Economics and Mathematics in 1964 and his Ph.D. in Economics in 1972.

Mr. Chu is currently Director of RAND's Washington Office and Associate Chairman of RAND's Research Staff.

Mr. Chu served as Assistant Secretary of Defense (Program Analysis and Evaluation) from July 1988 until January 1993; he had earlier exercised similar responsibilities as Director, Program Analysis and Evaluation (1981-1988). In these positions he advised the Secretary and Deputy Secretary of Defense on the allocation of the Department's resources, helping plan the forces and weapons systems that determine long-term defense capabilities. He supervised an immediate staff of 130, and a computer and research effort of nearly equal size. His contributions over the period 1981-93 were recognized by the Wanner Memorial Award of the Military Operations Research Society.

Prior to his Pentagon appointments, Mr. Chu was the Assistant Director of the Congressional Budget Office for National Security and International Affairs (1978-1981). During his tenure he supervised the preparation of over two dozen major reports on national security and international economic issues for various committees of the Congress, on subjects ranging from the management of military manpower, to US forces for NATO, to trade and aid policies.

Earlier, Mr. Chu served as an economist with RAND (1970-1978), and was also the Associate Head of the Economics Department (1975-1978). Mr. Chu served in the US Army from 1968-1970.

Mr. Chu is a member of Phi Beta Kappa, and was an Honorary Woodrow Wilson Fellow. During his graduate study he held fellowships from the National Science Foundation and the Foreign Area Fellowship Program. He has been awarded the Department of Defense Medal for Distinguished Public Service with Silver Palm and the National Public Service Award of the National Academy of Public Administration, of which he is a Fellow.

18 April 1996

Francis A. Finelli
Legislative Assistant to Senator Dan Coats (R-IN)

Russell Senate Office Building, Room 404
Washington, DC 20510

Phone: 202-224-8731
FAX: 202-228-4745

Frank Finelli joined the staff of Senator Dan Coats in the spring of 1997 after retiring as a Lieutenant Colonel from the US Army. He currently serves as the Legislative Assistant responsible for defense matters and also supports intelligence and foreign affairs policy issues.

Mr. Finelli served as a joint warfighting analyst with the Joint Staff in Washington, DC from 1994 through 1997. During that period, he was chosen as a Special Assistant to the Chairman of the Joint Chiefs of Staff for the Quadrennial Defense Review (QDR). In this role, he participated in the strategy-driven force assessment methodology employed by the Office of the Secretary of Defense, Joint Staff and Military Services to meet the requirements of the Military Force Structure Review Act of 1996. Formerly, he worked for the Vice Chairman of the Joint Chiefs in developing the Joint Warfighting Capability Assessment (JWCA) process to assess military recapitalization programs for the Joint Requirements Oversight Council (JROC). In this role, Mr. Finelli drafted the Chairman's comprehensive resource policy submissions to the Secretary of Defense — his Program Recommendations (CPR) and Program Assessment (CPA).

From 1989 to 1993, Mr. Finelli served in Field Artillery assignments with 1st Armored Divisions in Nuremberg, Germany and 3d Infantry Division in Vilseck, Germany. His positions included Operations Officer for a mechanized artillery battalion, Fire Support Officer for an armored brigade and Deputy Operations Officer for Division Artillery. He also served as Aide de Camp to the Commander in Chief of US Army Europe.

From 1986 to 1989, Mr. Finelli served as an Associate Professor of Economics on the faculty of the US Military Academy at West Point, New York. During this period, he taught econometrics and financial management. Mr. Finelli also served as the Deputy Director of the Office of Economic and Manpower Analysis where he was responsible for conducting manpower, procurement and business practice efficiency studies for General Max Thurman, then Army Vice Chief of Staff, and other senior defense leaders.

Mr. Finelli's first military assignment was in the 82d Airborne Division, Fort Bragg, North Carolina. He commanded C Battery, 2d Battalion (Airborne) 321st Field Artillery and held numerous staff and leadership positions dealing with fire support and unit logistics.

Mr. Finelli is a distinguished graduate of the US Military Academy, Class of '79, where he was a Cadet Captain and Varsity letterman in swimming and water polo. In 1986, he graduated with a Master of Sciences in Management with concentrations in Finance, Applied Economics and Operations Research from the Sloan School of Management, Massachusetts Institute of Technology. In 1994, Mr. Finelli also received a Masters of Military Arts and Sciences in Strategy with Honors from the US Army Command and General Staff College.

Mr. Finelli was awarded the Chartered Financial Analyst (CFA) designation in 1990 and has annually received accreditation from the Association of Investment Management and Research. He is also a former member of the Military Operations Research Society. His military awards include the Defense Superior Service Award, the Legion of Merit, the Honor Cross of the German Armed Forces in Silver, the Ranger Tab and the Master Parachutist badge.

Mr. Finelli was born in Akron, Ohio on June 24, 1957. He is married to the former Katherine Sills Klein of St. Petersburg, Florida. The Finelli's have 3 children: Paul (11), Andrew (9) and Laura (6).

Michele Flournoy

Michele A. Flournoy is Acting Principal Deputy Assistant Secretary of Defense for Strategy and Threat Reduction and Deputy Assistant Secretary of Defense for Strategy. In this capacity, she has worked on issues ranging from the National Security Strategy to lessons learned from Somalia to the military implications and costs of NATO enlargement. She was also the principal author of the "shape-respond-prepare" defense strategy developed in the 1997 Quadrennial Defense Review.

Prior to joining the Office of the Secretary of Defense, Ms. Flournoy was a Research Fellow at the Center for Science and International Affairs at Harvard's John F. Kennedy School of Government. There, she managed three collaborative research projects, edited *Nuclear Weapons After the Cold War: Guidelines for US Policy* (Harper Collins, 1992), co-edited *New Nuclear Nations: Consequences for US Policy* (Council on Foreign Relations, 1993), and wrote numerous policy analyses, book chapters and articles on a variety of international security issues.

While at Harvard, she also acted as the principal advisor to the Carnegie Commission on Reducing the Nuclear Danger (chaired by McGeorge Bundy, ADM William Crowe, USN (Ret.) and Dr. Sidney Drell) in the writing of its report, *Reducing Nuclear Danger: The Road Away From the Brink*.

Prior to her years at Harvard, Ms. Flournoy was a senior research analyst at several non-profit organizations in Washington, including the Arms Control Association, where she specialized in nuclear weapons and arms control issues.

Ms. Flournoy received an M.Litt. in International Relations/Strategic Studies from Balliol College, Oxford University, where she was a Newton-Tatum Scholar. She earned a B.A. in Social Studies from Harvard University.

Ms. Flournoy is a term member of the Council on Foreign Relations, a member of the International Institute of Strategic Studies and a member of the Executive Board of Women in International Security.

Col Mark P. Gay
Director, Future Battle Directorate
Headquarters, US Army Training and Doctrine Command
Fort Monroe, Virginia

Colonel Mark P. Gay is a native of Vicksburg, Mississippi. Graduated from the United States Military Academy in 1972 with a Bachelor of Science degree, he also holds Master Degrees from the University of Colorado (M.P.A., 1975) and the Army Command and General Staff College (M.M.A.S., 1985). Colonel Gay is additionally a graduate of the Marine Corps Amphibious Warfare School, the Army's Advanced Military Studies Program, and the Air Force War College.

Following his 1972 commissioning in the Field Artillery, Colonel Gay completed Airborne and Ranger Schools and the Field Artillery Officer Basic Course enroute to his first duty assignment with the 4th Infantry Division (Mechanized). There he performed as a firing battery officer with the 2d Battalion 20th Field Artillery until June 1975, when he was reassigned as a Fire Support Coordinator with the 1st Battalion (Ranger) 75th Infantry at Fort Stewart, Georgia. The following summer he joined the newly activated 24th Infantry Division, and served as Commander, Battery, B, 1st Battalion 13th Field Artillery (155mm-Towed).

In May 1978, Colonel Gay was selected for duty as aide-de-camp to the Commandant, Army War College. He was subsequently chosen to attend the Marine Corps Amphibious Warfare School at Quantico, Virginia. Graduating in May 1980, Colonel Gay returned to duty with the 1st Ranger Battalion; however he suffered a serious parachute training injury, and was reassigned as an Assistant to the 24th Infantry Division Personnel Officer (G-1). In January of 1982, Colonel Gay assumed command of G Battery 33d Field Artillery, the Division's target-acquisition battery. He relinquished command in July 1983, and reported to the Army Command and General Staff College at Fort Leavenworth, Kansas.

While at Leavenworth, Colonel Gay was among 24 student-officers selected to attend the Army's second "pilot" course of its Advanced Military Studies Program (AMSP). In order to fulfill his planner's internship as an AMSP graduate, he was assigned in 1985 as Division Plans Officer for the 8th Infantry Division (Mechanized). In October 1986, Colonel Gay was reassigned to the 8th Division Artillery at Baumholder, Germany. There he performed successively as a Battalion Operations Officer, Executive Officer, and Division Artillery Operations Officer until June 1989. He next assumed command of the 6th Battalion 29th Field Artillery and the Military Subcommunity at Idar-Oberstein, Germany.

More recently, Colonel Gay attended the Air War College at Maxwell Air Force Base, Alabama from August 1991 until June 1992. Following graduation, he remained at Maxwell as a joint-warfighting instructor in the College's Department of Regional and Warfare Studies. In July 1994, Colonel Gay returned to Europe as Deputy Commander, V Corps Artillery and served subsequently as Deputy Commander/Chief of Staff for Combined Task Force PROVIDE COMFORT in Incirlik, Turkey (Nov '94-May '95) before assuming duties as Chief of Staff (Forward) for V Corps in Heidelberg, Germany. Beginning in December 1995, Colonel Gay represented USAREUR and EUCOM during Operation JOINT ENDEAVOR as US National

Representative to COMIFOR and Chief, US National Coalition Cell in Zagreb, Croatia and Sarajevo, Bosnia-Herzegovina.

Colonel Gay's decorations include the Legion of Merit, the Defense Meritorious Service Medal (three awards), the Meritorious Service Medal (three awards), Army Commendation Medal (two awards) and Army Achievement Medal.

Colonel Gay is currently the Director, Future Battle Directorate, Office of the Deputy Chief of Staff for Doctrine, Headquarters US Army Training and Doctrine at Fort Monroe, Virginia.

Colonel Gay is married to the former Susan Drees. They have two children, son Christopher, 21, a senior at the University of Texas/Austin and daughter Gretchyn, 19, who is in her sophomore year at the University of Alabama/Tuscaloosa.

Dr. J. Michael Gilmore

Education

BSc, Physics, Massachusetts Institute of Technology, 1976

MS, Nuclear Engineering, University of Wisconsin, 1978

PhD, Nuclear Engineering, University of Wisconsin, 1980

Positions Held

1994-Present Deputy Director, General Purpose Programs, OD/PA&E

1993-1994 Director, Operations Analysis and Procurement Planning Division, OD (PA&E)
Resource Analysis

1993 Director, Weapons System Cost Analysis Division, OD(PA&E)/Resource
Analysis

1990-1993 Analyst, Strategic Defense and Space Programs Division, OD (PA&E)/Strategic
Programs

1989-1990 Principal Scientist, Falcon Associates, McLean, Virginia

1985-1989 Analyst and Chief Analyst (1985-1989) and Chief Analyst/Manager Electronic
Systems Company Activities (1989), McDonnell Douglas Washington Studies
and Analysis Group, Rosslyn, Virginia

1981-1985 Research Physicist, Magnetic Fusion Energy Program, Lawrence Livermore
National Laboratory, Livermore, California

Publications

Modular Automated Intelligence Fusion Center (MAIFC) Conceptual Design Study, Office of
the Assistant Secretary of Defense, Command, Control, Communications, and Intelligence, 1988.

Post-Attack Command Center Connectivity, Department of the Air Force, 1988.

"A Quantitative Methodology for Evaluating Command Center Survivability," in Proceedings of
MILCON '87, October 1987.

Alternative Command Center Architectures, Defense Nuclear Agency, October 1986.

"Radial Transport Calculations for Tandem Mirrors," Nuclear Fusion, Vol. 23, Number 6, 1983.

ADM David Jeremiah
Admiral, United States Navy (Retired)

Admiral David E. Jeremiah is Partner and President of Technology Strategies & Alliances Corporation, a strategic advisory and investment banking firm engaged primarily in the aerospace, defense, telecommunications and electronics industries.

During his military career Admiral Jeremiah earned a reputation as an authority on strategic planning, financial management and the policy implications of advanced technology.

Prior to leaving military service in February 1994, Admiral Jeremiah served four years as Vice Chairman Joint Chiefs of Staff for Generals Powell and Shalikashvili. He was Colin Powell's alter ego during the Gulf War and a key player for both Chairman in the transition to a post-Cold War military.

Admiral Jeremiah was Commander in Chief of the United States Pacific Fleet from 1987-1990. He commanded a task force, battle group and destroyer squadron in earlier tours in the Mediterranean. In October 1985 he directed the capture of the Achille Lauro hijackers and in April 1986 led combat operations against Libya in the Gulf of Sidra. Ashore, Admiral Jeremiah served as Director, Navy Program Planning and in financial planning positions on the staffs of the Secretary of Defense and Chief of Naval Operations.

Currently, Admiral Jeremiah serves on the Boards of Directors for Litton Industries, Alliant Techsystems Inc., Geobiotics, Inc., Standard Missile Company and the National Committee on US-China Relations, advisory boards for ManTech International, Northrop Grumman Corporation, the Jewish Institute for National Security Affairs and the International Council of the George Washington University Elliott School of International Affairs. Admiral Jeremiah has also served as a member of the National Defense Panel and the Defense Policy Board, each of which advised the Secretary of Defense.

Admiral Jeremiah earned a bachelors degree in Business Administration from the University of Oregon and a masters degree in Financial Management from George Washington University. He completed the Program for Management Development at Harvard University.

He and his wife, Connie, live in Oakton, Virginia. They have two adult daughters.

11 March 1998

Vice Admiral Conrad C. Lautenbacher, Jr.
Deputy Chief of Naval Operations
(Resources, Warfare Requirements and Assessments)

A native of Philadelphia, Pennsylvania, and a graduate of the US Naval Academy (Class of '64), Vice Admiral Lautenbacher has served in a broad range of operational, command and staff billets.

Operational tours include Division Officer in USS WASP (CVS-18) and USS HENRY B. WILSON (DDG-7), a second tour on the USS HENRY B. WILSON (DDG-7) as Department Head, and Executive Officer of USS BENJAMIN STODDERT (DDG-22). Areas of expertise include Anti-Submarine Warfare, Anti-Air Warfare and Naval Surface Fire Support, with expertise gained during a number of deployments to the Western Pacific and Southeast Asia during the Vietnam War.

Command experience includes tours as Commanding Officer of USS HEWITT (DD-966), where he participated in operations in the Western Pacific, Indian Ocean and North Arabian Sea, and as Commander Naval Station, Norfolk, the Navy's largest naval station. While in command of Cruiser-Destroyer Group FIVE, he deployed to Saudi Arabia with additional duties as Commander, US Naval Forces Central Command, Riyadh during Operation Desert Shield and Desert Storm. Functioning as the deputy Naval Component Commander, he was in charge of daily operational planning for Navy participation in the air war and was the naval representative to the Commander in Chief, Central Command. Most recently, Vice Admiral Lautenbacher was Commander, THIRD Fleet, where he introduced integrated, joint and combined training concepts to the Pacific Fleet, prepared the Third Fleet to function as the core of a sea-based Joint Task Force and developed the sea-based Battle Laboratory Initiative.

Staff duties include significant education and assignments in resource analysis and management. A proven subspecialist in Operations Analysis, Vice Admiral Lautenbacher attended Harvard University receiving MS and PhD degrees in Applied Mathematics. He was selected as a Navy Federal Executive Fellow and served at the Brookings Institute. Experience tours include positions as systems analyst with both the Office of the Assistant Secretary of Defense (Systems Analysis) and the Chief of Naval Operations Staff, and again on the Chief of Naval Operations Staff as the chief developed of the Navy Program Objectives Memorandum.

As a flag officer, he served as Deputy Chief of Staff for Management/Inspector General on the staff of Commander in Chief, US Pacific Fleet; Director of Force Structure, Resources and Assessment (J-8) on the Joint Staff, where he contributed to the development of the Base Force and Bottom Up Review; Special Assistant to the Assistant Secretary of the Navy (Financial Management); and Director, Office of Program Appraisal, on the Staff of the Secretary of the Navy. His current assignment is Deputy Chief of Naval Operations (Resources, Warfare Requirements and Assessments).

Other staff assignments include: Assistant for Strategy with the CNO Executive Panel; Flag Lieutenant to the commander in Chief, US Naval Forces Europe; and Personal Aide to the VCNO.

Vice Admiral Lautenbacher has been awarded the Defense Distinguished Service Medal, the Distinguished Service Medal (two awards), the Legion of Merit (four awards), the Meritorious Service Medal (three awards), the Navy Commendation Medal, the Navy Achievement Medal with Combat "V," the Navy Unit Commendation, the Meritorious Unit Commendation (two awards) and the Combat Action Ribbon. Vice Admiral Lautenbacher is married to the former Susan Elizabeth Scheihing of Philadelphia. They are the proud parents and in-laws of a daughter, Elizabeth and her husband, Jake; and a son John, and his wife, Catherine.

Major General Charles D. Link
United States Air Force, Retired

Prior to his August 1997 retirement from the Air Force, Major General Charles D. Link was the Special Assistant to the Chief of Staff for the National Defense Review, Headquarters US Air Force, Washington, DC.

General Link entered the US Air Force in August 1957 in the enlisted ranks as a jet engine and aircraft mechanic. He then entered Air Force Officer Candidate School and was commissioned in June 1963. In March 1964, General Link became the commander of the 647th Mobile Training Detachment at Kirtland AFB, NM. In May 1965, he became the commander of the 531st Field Training Detachment at Kirtland AFB, NM.

In January 1967, General Link entered pilot training at Williams AFB, AZ. In 1968, after receiving pilot wings, General Link transferred to MacDill AFB, FL to attend F-4 training and then to Hurlburt Field, FL to attend OV-10 forward air controller training.

The general then was assigned to the Republic of Vietnam front July 1969 until June 1970, as a forward air controller for the 1st Brigade, 1st Air Cavalry Division, Tay Ninh, South Vietnam where he accumulated over 800 combat flying hours. After his assignment in South Vietnam, General Link was assigned to the 23rd Tactical Fighter Squadron, US Air Forces in Europe Spangdahlem Air Base, West Germany. He served as a squadron pilot and then subsequently as squadron flight commander. Chief of 52nd Tactical Fighter Wing Standardization and Evaluation Division, and 23rd Tactical Fighter Squadron Operations Officer from August 1970 until August 1974. In August 1974, General Link entered Air Command and Staff College, Air University at Maxwell AFB, AL. Upon completion, the general was assigned to the Headquarters US Air Force, Washington, DC, first as an International Politico-Military Affairs Officer and then later as the Executive Officer to the Director of Plans.

In June 1980, the general was transferred to the Pacific Air Forces, Osan Air Base, Korea as the Director of Combat Operations. 314th Air Division and Commander, 603rd Tactical Air Control Squadron. General Link later became the Deputy Commander for Operations, 51st Composite Wing and, in July 1982, Commander, 51st Combat Support Group at Osan Air Base. In August 1983, General Link returned to attend National War College, National Defense University at Fort Lesley J. McNair in Washington, DC. Upon completion, the general was assigned to Osan Air Base as Commander, 51st Tactical Fighter Wing.

In September 1985, General Link returned stateside as the Deputy Assistant Director, and later Director, for Joint and National Security Council Matters, Headquarters US Air Force, Washington, DC. General Link was then assigned as the Assistant Deputy Director and later Deputy Director, Politico-Military Affairs, J-5 the Joint Staff, the Pentagon, Washington, DC, in July 1987.

After his assignment on the Joint Staff, General Link served as the Commandant of the Air Command and Staff College at Maxwell AFB, AL from July 1989 until May 1990. He then

served as Commandant of the Air War College and Vice Commander Air University at Maxwell AFB, AL, from May 1990 until July 1991.

In July 1991, General Link was assigned to the 3rd Air Force, Headquarters US Air Forces in Europe, Royal Air Force Mildenhall England as Commander 3rd Air Force. The general then served in Germany as the Director, Plans and Policy, J-5. US European Command, Stuttgart-Vaihingen, Germany, from August 1993 until July 1994.

July 1994 brought General Link back stateside to serve as the Special Assistant to the Chief of Staff for Roles and Missions, the Pentagon, Washington, DC, until November 1995. The general then served as the Assistant Deputy Chief for Plans and Operations at the Pentagon from November 1995 until November 1996 when he was reassigned as the Special Assistant to the Chief of Staff for the National Defense Review, Headquarters US Air Force, Washington, DC, until August 1997.

General Link earned a Bachelor of Science degree in Social Studies from Troy State University in 1975. He completed Air Command and Staff College in 1975 and the National War College in 1984.

The general's military decorations and awards include the Distinguished Service Medal, Defense Superior Service Medal, Legion of Merit with two bronze oak leaf clusters, Distinguished Flying Cross with bronze oak leaf cluster, Meritorious Service Medal bronze oak leaf cluster Air Medal with two silver oak leaf clusters and a bronze oak leaf cluster, Air Force Commendation Medal, Presidential Unit Citation with bronze oak leaf cluster, Vietnam Service Medal with three bronze service stars, Republic of Vietnam Gallantry Cross with Palm and Republic of Vietnam Campaign Medal.

General Link is married to the former Elisabeth Kioth of Aachen, Germany. They have four children; Mary, Frank, Ruth and Michael. They retired to Vienna, VA. General Link serves as Executive Vice President of the Air Force Memorial Foundation.

Rear Admiral Michael A. McDevitt, USN (Ret)
Senior Fellow
Center for Naval Analyses

As Senior Fellow with the Center for Naval Analyses, Rear Admiral McDevitt is a specialist in East Asian Security Policy and long range strategic planning.

Active Duty Background

1995-1997: Commandant of the National War College. Responsible for the management, budget, curriculum, faculty and student body of the nation's premiere institution of strategic studies. Increased curriculum focus on Asia and instituted a major curriculum revision entitled "*An Inquiry into the Future of Conflict*." This put more focus on the future; particularly the next two decades. Instituted an East Asia security roundtable for the Washington, DC policy community.

1993-1995: Director for Strategy, Policy and Plans (J-5) for the Commander in Chief, US Pacific Command (CINCPAC). Supervised a staff of 60 people, a strategy branch, a wargaming center, an economic analysis section and all war plans for East Asian contingencies. Traveled extensively throughout East and South Asia singly or with the commander. Participated in all high-level meetings with prime ministers, ministers of defense and foreign affairs, uniformed heads of armed services and service chiefs.

1992-1993: Commander of the *George Washington* Aircraft Carrier Battle Group. Responsible and accountable for the organization, training and safe operation of the Navy's newest (at that time) battle group - an assemblage of 26 different ship, submarine and aviation commands. On two different occasions, served as at sea commander for counter-drug operations in the Caribbean.

1990-1992: Director of the East Asia Policy Division, ISA, Office of the Secretary of Defense and for 13 months was Acting Deputy Assistant Secretary of Defense for East Asia when the incumbent was given a new position. Developed and implemented security policy for East Asia, including the first and second East Asia Strategy reports to Congress. Led or participated in policy discussions with defense officials throughout Asia. On three occasions, led delegations to Hanoi and Vientiane to negotiate issues surrounding unaccounted-for Americans. Participated or led US delegation in all Taiwan arms sales conferences during this period.

1988-1990: Director of the Chief of Naval Operations Executive Panel and Director of Navy Long-Range Planning (OP-00K). Involved in a wide variety of projects for then-CNO, Admiral Trost. A heavy focus on addressing Soviet naval arms control initiatives and developing long range planning techniques. First studies on shaping a post-Cold War navy.

1986-1988: Commander of Destroyer Squadron 13, US Pacific Fleet. Responsible for up to nine destroyers and frigates. Deployed with the *Constellation* Battle Group. While embarked in *Constellation* acted as Battle Group Antisubmarine and Antisurface Warfare Commander.

1983-1986: Deputy Director of the Warfare Appraisal Division (OP-950) in OPNAV. Responsible for the development and presentation of the Summary Warfare Appraisal to the CNO. Responsible for demonstrating a direct linkage between the Maritime Strategy and the Navy POM. Developed a means to "net assess" Navy capability versus the warfighting tasks implied by the strategy. Also responsible for the first Command and Control Appraisal and the first Space Appraisal.

1982-1983: Member of the second group of SSG fellows. Played an active role in the development of concepts of operations for the Pacific and Mediterranean theaters that were later incorporated into the Maritime Strategy.

1980-1982: Command of the destroyer USS *Oldendorf* (DD-972), US Pacific Fleet.

1963-1980: Various assignments at sea in the Pacific, including command of the minesweeper, USS *Peacock* (MSC-198), homeported in Sasebo, Japan. Shore assignments during this time were in Washington, DC. These included stints as a BUPERS detailee, a graduate student at Georgetown, an OPNAV action officer responsible for officer training and qualifications and a student at the National War College.

Education

Fellow, Seminar XXI, Massachusetts Institute of Technology, 1995-96.

Fellow, Chief of Naval Operations Strategic Studies Group, 1982-1983.

Graduate, National War College, 1980.

MA, Georgetown University (American Diplomatic History), 1975.

BA, University of Southern California (History), 1963.

28 January 1998

Colonel Richard C. Payne

Colonel Richard C. Payne, who is a native of Alexandria, Virginia, was commissioned a Second Lieutenant of Armor in 1968 as a Distinguished Military Graduate from the ROTC program at the University of Virginia. After receiving his Ph.D. in English Language and Literature from Princeton University in 1972, Colonel Payne was appointed Assistant Professor of English at the University of Chicago. He taught there from 1972 to 1980, concurrent with Reserve Forces assignments in the Illinois National Guard and US Army Reserve. Highlights of these assignments include: Commander, Troop E/106th Cavalry, 33d Infantry Brigade, Illinois National Guard; Assistant S-1 (Personnel Officer), 33d Infantry Brigade; and Squadron S-3 (Operations and Training Officer), 3-85th Training Regiment, 85th Division (Training), US Army Reserve.

In 1980, Colonel Payne returned to active duty to attend the Command and General Staff College, Fort Leavenworth, Kansas. Following short tours at the First US Army training evaluation headquarters, Fort A. P. Hill Virginia, and at the Personnel Division, Office of the Chief of Army Reserve, Washington, D.C., Colonel Payne began a four-year tour in the Army ROTC Detachment at Virginia Tech, where he served as Enrollment Officer, Scholarship Officer and Detachment Executive Officer. In 1986, he was transferred to the Office of the Deputy Chief of Staff for Personnel, Second US Army, Atlanta, Georgia. After serving two years with the DCSPER, Colonel Payne moved to the special Second Army management task force which involved resourcing and execution of Base Operations Support functions to Major US Army Reserve Commands. In 1990 he became Deputy Chief of Staff of the 100th Division (Training) in Louisville, KY, the USAR roundout organization to the Armor Center at Fort Knox. His four year tenure as the senior active duty Full Time Support officer in the 100th Division was marked by the mobilization of two training brigades to reinforce the US Army Armor Center at Fort Knox during Operation Desert Storm. Prior to joining the Army After Next project in December 1996, Colonel Payne served for three years in the Office of the Deputy Chief of Staff for Training, Headquarters, TRADOC, where he helped manage Initial Entry Training and the Total Army School System.

Colonel Payne's military decorations include the Meritorious Service Medal (with oak leaf cluster), the Army Commendation Medal (with oak leaf cluster), the Army Achievement Medal, the Army Reserve Components Achievement Medal (with X device), the National Defense Service Medal, the Armed Forces Reserve Medal (with oak leaf cluster) and the Army Service Ribbon. He is a 1993 graduate of the Army War College and resides in Hampton, Virginia, with his wife Dianne. They have three grown daughters.

MajGen Don Peterson

Major General Donald L. Peterson is assistant deputy chief of staff, air and space operations, Headquarters US Air Force, Washington, D.C. He provides support to the deputy chief of staff, air and space operations and serves in his absence in carrying out his responsibilities to the secretary of the Air Force and the chief of staff for the planning, operations, requirements and force structure necessary to support the warfighter with air and space power. As the Air Force deputy operations deputy to the Joint Chiefs of Staff, he determines operational requirements, concepts, doctrine, strategy, training and the assets necessary to support national security objectives and military strategy.

The general entered the Air Force in 1966 after graduating from Texas A&M University. During his career, he has commanded a tactical fighter squadron, a tactical fighter wing, a flying training wing, and the North American Aerospace Defense Command and US Space Command, Cheyenne Mountain Operations Center. His staff assignments include serving as a fighter operations officer and executive officer in the Air Staff, as chief of USAF operations assignments, as a major command inspector general and as director of plans and operations, Air Education and Training Command. He is a command pilot, having flown more than 4,000 hours, including 597 combat hours.

General Peterson and his wife, Gayle, have a son, Don.

Education

- 1966 Bachelor of business administration degree in finance, Texas A&M University
- 1975 Squadron Officer School
- 1980 Air Command and Staff College
- 1982 Master's degree in management, Auburn University
- 1982 Air War College, Maxwell Air Force Base, AL
- 1988 The Executive Development Program, Carnegie-Mellon University, PA
- 1995 Program for Senior Executives in National and International Security, Harvard University, MA

Assignments

1. October 1966 - October 1967, student, pilot training, Webb Air Force Base, TX
2. October 1967 - December 1971, EC/KC-135 aircraft commander, 71st and 913th Air Refueling Squadrons; assistant operations officer, 913th Air Refueling Squadron, Barksdale Air Force Base, LA
3. December 1971 - November 1972, student, F-4E transition training, MacDill Air Force Base, FL
4. November 1972 - July 1973, F-4E aircraft commander and flight leader, 435th Tactical Fighter Squadron, Ubon Royal Thai Air Force Base, Thailand

5. July 1973 - October 1977, F-4E instructor pilot, 309th Tactical Fighter Squadron; chief, academic instructor pilot; chief, current operations, 31st Tactical Fighter Wing; assistant squadron operations officer, 307th Tactical Fighter Squadron, Homestead Air Force Base, FL
6. October 1977 - July 1980, action officer, tactical division, directorate of operations, the Pentagon, Washington, D.C.
7. July 1980 - July 1981, assistant executive officer, deputy chief of staff for plans and operations, the Pentagon, Washington, D.C.
8. July 1981 - May 1982, student, Air War College, Maxwell Air Force Base, AL
9. May 1982 - June 1985, F-15 operations officer, 22nd Tactical Fighter Squadron; commander, 525th Tactical Fighter Squadron; assistant chief of maintenance, 36th Tactical Fighter Wing, Bitburg Air Base, West Germany
10. June 1985 - July 1987, chief, operations officer assignments division, Air Force Military Personnel Center, Randolph Air Force Base, TX
11. July 1987 - July 1988, vice commander, 325th Tactical Training Wing, Tyndall Air Force Base, FL
12. July 1988 - September 1990, commander, 27th Tactical Fighter Wing, Cannon Air Force Base, NM
13. October 1990 - February 1993, assistant deputy chief of staff, technical training, Headquarters Air Training Command; ATC inspector general; commander, 12th Flying Training Wing; installation commander, Randolph Air Force Base, TX
14. February 1993 - April 1994, command director, NORAD, Cheyenne Mountain Air Station, CO
15. April 1994 - May 1995, vice director, NORAD Combat Operations and commander, Cheyenne Mountain Operations Center, Cheyenne Mountain Air Station, CO
16. May 1995 - August 1996, director, plans and operations, Headquarters Air Education and Training Command, Randolph Air Force Base, TX
17. August 1996 - November 1996, director of plans, deputy chief of staff, plans and operations, Headquarters US Air Force, Washington, D.C.
18. November 1996 - present, assistant deputy chief of staff, air and space operations, Headquarters US Air Force, Washington, D.C.

Flight Information

Rating: Command pilot

Flight Hours: More than 4,000

Aircraft Flown: T-33, T-37, T-38, KC/EC-135, F-4C/D/E, F-15A/C and F-111D

Major Awards and Decorations:

Defense Superior Service Medal

Legion of Merit with oak leaf cluster

Distinguished Flying Cross

Meritorious Service Medal with two oak leaf clusters

Air Medal with 10 oak leaf clusters

Air Force Commendation Medal

Vietnam Service Medal with three service stars

Republic of Vietnam Gallantry Cross with Palm

Republic of Vietnam Campaign Medal

Effective Dates of Promotion:

Second Lieutenant, 19 October 1966

First Lieutenant, 19 April 1968

Captain, 19 October 1969

Major, 1 June 1978

Lieutenant Colonel, 1 November 1981

Colonel, 1 November 1985

Brigadier General, 1 August 1992

Major General, 1 July 1995

Dr. James G. Roche

James G. Roche is presently Corporate Vice President and General Manager of the Electronic Sensors and Systems Division (ESSD) of the Northrop Grumman Corporation. This new division resulted from the acquisition by Northrop Grumman of the defense electronics business of the Westinghouse Electric Company in 1996. Prior to this position he was Corporate Vice President and Chief Advanced Development, Planning and Public Affairs Officer responsible for the company's Advanced Technology and Development Center, Business Strategy Group, the Washington Analysis Center, State Relations and the Public Affairs Department. He led the Transition Team responsible for merging the Northrop, Grumman, and Vought corporations. Formerly, he was the Assistant to the Chairman, President and Chief Executive Officer. Prior to July, 1989, he was the Vice President and Director of the Northrop Analysis Center in Washington, D.C. (since 1984); the Center conducts policy and strategy analyses for the Corporation.

Before joining Northrop, Dr. Roche was the Democratic Staff Director of the Senate Committee on Armed Services, where he worked for Senators Scoop Jackson and Sam Nunn.

Dr. Roche served as the Principal Deputy Director of the State Department's Policy Planning Staff during 1981 and 1982.

He was a senior professional staff member of the Senate Select Committee on Intelligence (1979-81); and he was an Assistant Director of the Office of Net Assessment in the Office of the Secretary of Defense (1975-79).

Dr. Roche is a retired Captain in the US Navy, having commanded the USS *Buchanan* DDG-14. He is a winner of the Arleigh Burke Fleet Trophy (1974).

Dr. Roche holds a Doctorate from the Harvard Graduate School of Business Administration in the fields of Decision Analysis and Management Control (1972). He received his Master's Degree in Operations Research, with distinction, in 1966 from the US Naval Postgraduate School, and his Bachelor's Degree in English Literature in 1960 from the Illinois Institute of Technology.

He is on the board of advisors of a number of public policy institutions. He is the former Chairman of the Board of Trustees of the Georgia Tech Research Corporation. He was a member of the Secretary of Defense's Policy Board from 1989 to 1994; he is a member of the Council on Foreign Relations; he was the President of the Board of the World Affairs Council of Washington, D.C.; he is on the Board of Visitors of the University of Maryland; and he serves on the Board of Directors of M&F Worldwide, Inc.

Dr. Roche was married to Diane Mikula in their home town of Chicago, Illinois, on 22 August 1961, and they now reside in the Baltimore-Annapolis, area. Their daughter, Heather, resides in the Shenandoah Valley in Virginia.

Current Boards

Member of the Board of Directors of M & F Worldwide Corp
Member of the Board of Trustees, Naval Institute Foundation
Member of the Board of Trustees of the Maryland Historical Society
Member of the Board of Directors of the Historic Annapolis Foundation
Member of the Board of Advisors of the Washington Institute for Near East Studies
Member of the Advisory Board, California Democratic Leadership Council
Member of the International Advisory Board of the University of California Institute on Global Conflict and Cooperation (IGCC).
Member of the Advisory Board of the Washington Strategy Seminar
Member of the Board of the Center for Strategic and Budgetary Assessment
Member of the Board of Visitors of the University of Maryland

Other Professional Memberships

Senior Member, American Institute for Aeronautics and Astronautics
Member, National Aeronautics Association
Member., Council on Foreign Relations
Member, International institute for Strategic Studies
Member, Jewish Institute for National Security Affairs (JINSA)

September 1997

LtGen Martin Steele
Deputy Chief of Staff for Plans, Policies and Operations, HQMC

Lieutenant General Martin R. Steele assumed his current duties as the Deputy Chief of Staff for Plans, Policies and Operations, Headquarters Marine Corps, Washington, D.C. on February 3, 1997.

He was born in Philadelphia, Pennsylvania, and grew up in Fayetteville, Arkansas. He enlisted in the Marine Corps in January 1965. His initial tour of duty was with the 1st Tank Battalion, 1st Marine Division, Camp Pendleton, California. He deployed to the Republic of Vietnam later that same year. Subsequently assigned as a corporal to Officer Candidates School, he was commissioned a second lieutenant in January 1967.

A tour of duty as a platoon commander, executive officer, and tank company commander in the 2d Tank Battalion was followed by duty aboard the USS ST. PAUL (CA-73) in Southeast Asia and an assignment as Officer-in-Charge of Sea School in Portsmouth, Virginia. In 1973, he returned to Camp Pendleton and served as a tank company commander, battalion S-3, and Aide-de-Camp to the Commanding General of the 1st Marine Division.

An overseas assignment as an assault amphibian vehicle company commander and battalion S-3, was followed by duty as the Marine Corps Liaison Officer to the project Manager M-60/M-1 Tank programs at the US Army Tank-Automotive command in Warren, Michigan. He also served at Headquarters Marine Corps as the Tank Acquisition Project Officer.

In August 1985, General Steele returned to the 1st Marine Division, where he served initially as the Commanding Officer, 1st Light Armored Vehicle Battalion until June 1986, and then as the Commanding Officer, 1st Tank Battalion until June 1988. The following month, he transferred overseas where he was assigned as Operations Officer, C/J/G-3, Combined Forces Command, Republic of Korea. Upon his return from overseas in August 1990, he assumed the duties as the Deputy Director, Marine Air-Ground Task Force Warfighting Center, MCCDC Quantico, Virginia.

During Operation Desert Shield/Desert Storm, General Steele served as G-3, MARCENT (FWD) aboard the USS BLUE RIDGE. In July 1992, he was assigned duty as the Director, Warfighting Development Integration Division at Quantico. While serving in this capacity, he was selected in March 1993 for promotion to brigadier general. He was promoted to that grade on May 20, 1993, and was assigned duty as Commanding General, Marine Corps Base, Quantico on June 15, 1993. While serving in this capacity, he was selected in November 1994 for promotion to major general. He served as the Director for Strategic Planning and Policy, J-5, USCINCPAC, Camp H.M. Smith, Hawaii from April 17, 1995 to February 2, 1997.

General Steele holds a B.A. degree from the University of Arkansas (1974); M.A. degrees from Central Michigan University (1981), Salve Regina College (1985), and the Naval War College. He is a distinguished graduate of the Armor Officer Advanced Course; an honor graduate of the Marine Corps Command and Staff College; and a graduate of the Naval War College.

His personal decorations include: the Defense Distinguished Service Medal; Defense Superior Service Medal; Legion of Merit; Meritorious Service Medal; Navy Commendation Medal with gold star; and the Combat Action Ribbon.

Lieutenant General Steele is married to the former Cynthia Bayliss of Little Rock, Arkansas. They have three children: Diane, David and Deborah.

28 October 1997 HQMC

Lieutenant General Paul K. Van Riper, USMC (Ret.)

General Van Riper was born on July 5, 1938, in Brownsville, Pennsylvania, and graduated from high school in Dormont, Pennsylvania, in June 1956. He enlisted in the Marine Corps Reserve and underwent recruit training at the Marine Corps Recruit Depot, Parris Island, South Carolina, in the fall of 1956. After completing infantry training in April 1957, he was released from active duty and returned home to serve in the 12th Infantry Battalion of the Marine Corps Reserve. He graduated in June 1963, from California State College, California, Pennsylvania, with a Bachelor of Arts degree. He then entered the 34th Officer Candidate Course and was commissioned a second lieutenant in November 1963.

After completing The Basic School at Quantico, Virginia, in June 1964, General Van Riper reported to the 1st Battalion, 8th Marines, 2d Marine Division, Camp Lejeune, North Carolina. While with the 1st Battalion, he served as a Platoon Commander, Company Executive Officer, and Assistant Operations Officer. He was with the 1st Battalion when it was committed to Santo Domingo during the Dominican Republic crisis in the spring of 1965.

In late 1965, he was ordered to the Republic of Viet Nam for duty as an Advisor with the Vietnamese Marine Corps. He was wounded in action on February 7, 1966, and was evacuated to the United States Naval Hospital in Philadelphia. After recovering from his wounds in April 1966, General Van Riper returned to The Basic School as an instructor. Upon completion of his tour in February 1968, he remained at Quantico as a student at Amphibious Warfare School.

General Van Riper returned to Viet Nam in September 1968, where he served as a Company Commander and an Assistant Operations Officer with the 3rd Battalion, 7th Marines, 1st Marine Division. Upon his return to the US in September 1969, he was assigned as an instructor at the US Army's John F. Kennedy Institute of Military Assistance at Fort Bragg, North Carolina. He was transferred to Headquarters Marine Corps, Washington, DC, in July 1971, where he served initially as a Special Projects Officer in the Office of the Chief of Staff and then as a Training Specialist in the Training Division until August 1974.

Ordered to the 2d Marine Division, Camp Lejeune, in September 1974, he was assigned as the Operations Officer of the 3rd Battalion, 8th Marines. He became the Regimental Operations Officer in September 1975, and the Executive Officer for the 1st Battalion, 8th Marines in December 1976.

From August 1977 until June 1978, General Van Riper was a student in the College of Naval Command and Staff at the Naval War College, Newport, Rhode Island. Subsequently, he was assigned as a Military Observer with the United Nations Truce Supervision Organization in Palestine. During this tour he served in Egypt, Israel, and Lebanon.

Upon completion of his overseas tour in September 1979, General Van Riper was assigned as the Commanding Officer, Marine Barracks, Naval Air Station, Cecil Field, Florida, until July 1981. From August 1981, until June 1982, he was a student at the Army War College in Carlisle, Pennsylvania.

General Van Riper was transferred to the 7th Marines, 1st Marine Division, Camp Pendleton, California, in June 1982, and served as Regimental Executive Officer until May 1983, when he assumed command of 2d Battalion, 7th Marines. In August 1984, he was assigned to the Exercise, Readiness and Training Branch of the G-3 Section, I Marine Amphibious Force.

General Van Riper was transferred to the 3rd Marine Division on Okinawa in June 1985, where he commanded the 4th Marines until December 1986. He served as the Assistant Chief of Staff, G-3, 3d Marine Division from December 1986 until reassigned as the Division Chief of Staff in June 1987.

During July 1988, General Van Riper returned to Quantico, where he was assigned until July 1989 as the Director of the Command and Staff College. He became the first President of Marine Corps University, Marine Air-Ground Training and Education Center in July 1989. In July 1990, he was assigned as Deputy Commander for Training and Education and Director, Marine Air-Ground Training and Education Center, Marine Corps Combat Development Command. General Van Riper served temporarily as a member of the Marines Forces, United States Central Command/I Marine Expeditionary Force staff during Operations Desert Shield and Desert Storm from January to March 1991. From June 1991 to April 1993, he was the Commanding General, 2d Marine Division, Camp Lejeune, North Carolina.

Returning to Washington, DC, General Van Riper served as Assistant Chief of Staff, Command, Control, Communications and Computers and as Director of Intelligence, Headquarters Marine Corps from April 1993, until July 1995. He was advanced to Lieutenant General and became Commanding General Marine Corps Combat Development Command in July 1995; Lieutenant General Van Riper retired on 1 October 1997, after more than 41 years of service.

General Van Riper's personal decorations include the Distinguished Service Medal; Silver Star Medal with gold star; Legion of Merit; Bronze Star Medal with Combat "V"; Purple Heart; Meritorious Service Medal; Joint Service Commendation Medal; Army Commendation Medal; Navy Achievement Medal; and the Combat Action Ribbon with gold star. He is a graduate of the US Army's Airborne and Ranger Schools.

General Van Riper is married to the former Lillie Catherine Alford of Dillion, South Carolina. They have a son, Stephen, a Marine Officer, and a daughter, Cynthia.

GEN Larry D. Welch, USAF (Retired)

Born: June 9, 1934 in Morning Star, Oklahoma

Education

BS - Business Administration, University of Maryland
MS - International Relations, George Washington University
Armed Forces Staff College (Intermediate Professional Education)
National War College (Senior Professional Education)
Harvard National Security Seminar (Graduate Seminar)

Professional Experience

President and Chief Executive Officer of The Institute for Defense Analyses (IDA) in Washington DC — a federally chartered research center providing operations and technical analysis, and management and information systems design and development for the Department of Defense and other US government agencies.

Chief of Staff, United States Air Force 1986-1990

Senior uniformed officer responsible for organizing, equipping and executive direction. Member of the Joint Chiefs of Staff, serving with the Chairman and other service chiefs as military advisors to the Secretary of Defense and the President on National Security Matters.

Commander in Chief, Strategic Air Command 1985-1986

Joint Specified Command responsible for operational planning for all US strategic nuclear systems. Air Force field command responsible for the operational readiness of the bomber and ICBM legs of the strategic nuclear deterrent.

Vice Chief of Staff, US Air Force 1984-1985

Responsible for the day to day work of the Headquarters, USAF staff and coordination with other services and other government agencies.

Deputy Chief of Staff, Programs & Resources, Hq USAF 1982-1984

Responsible for formulating program proposals, long range programming and manpower and organization. Also responsible for programs for sales of military equipment, and associated training and logistics support plans to foreign nations.

Commander, Air Force Central Command and 9th Air Force 1981-1982

Responsible for the daily command and management of USAF tactical forces in the eastern half of the US Also serves as air component commander to the United States Central Command.

Headquarters Tactical Air Command 1977-1981

Served successively as inspector general, deputy chief of staff (DCS) for plans and deputy chief of staff for operations.

Tactical Fighter Wing Commander 1974-1976

Commanded the first operational F-15 Wing.

Earlier service

Enlisted in the National Guard in 1951 then enlisted in the Air Force. Entered officer and pilot training in 1954. Assignments included operational and staff assignments in training organizations and tactical fighter units worldwide to include combat in Vietnam.

Professional Associations and Activities

Aerospace Education Foundation, Director

Air Force Academy Foundation, Director

Atlantic Council, Councilor

Boy Scouts of America, National Capitol Area Council Executive Board, Member

Commission on Maintaining US Nuclear Weapons Expertise, Member

Commission to Assess the Ballistic Missile Threat to the United States, Member

Council on Foreign Relations, Member

Defense Intelligence Agency Science and Technology Advisory Board, Member

Defense Science Board, Member

Henry L. Stimson Center, Board of Directors

Institute for Defense Analyses, Board of Trustees

Joint Committee on Nuclear Weapons Surety (DoD/DoE), Chairman

Lawrence Livermore National Laboratory National Security Advisory Committee

National Eagle Scout Association, Member

President's Security Policy Advisory Board, Chairman

US Strategic Command Strategic Advisory Group, Member

February 1998

QDR Mini-Symposium Acronym List

A&T	Acquisition and Technology
AAA	Anti Aircraft Artillery
AC	Active Component
ACTD	Advanced Concept Technology Demonstration
AF	Air Force
AFM	Army Flow Model
AOR	Area of Operational Responsibility
ARES	Advanced Regional Exploratory System
AVCSA	Assistant Vice Chief of Staff Army
AWACS	Airborne Warning and Control System
BAH	Booz Allen & Hamilton
BCIS	Battlefield Combat Identification System
BEF	Baseline Engagement Force
BRAC	Base Realignment and Closure
BUR	Bottom Up Review
BW	Biological Warfare
C3	Command, Control, Communication
C4	Command Control, Communication, Computers
C4ISR	Command Control, Communication, Computers, Intelligence, Surveillance and Reconnaissance
CAA	Center for Army Analysis formerly known as Concepts Analysis Agency
CNA	Center for Naval Analyses
CBW	Chemical and Biological Warfare
CINC	Commander in Chief
CJCS	Chairman of the Joint Chiefs of Staff
CLW	Center for Land Warfare
CONOPS	Concept of Operations
CONUS	Continental United States
CS/CSS	Combat Support/Combat Service Support
CVBG	Carrier Battle Group
CW	Chemical Warfare
DAWMS	Deep Attack Weapons Mix Study
DC	Dynamic Commitment
DIA	Defense Intelligence Agency
DoD	Department of Defense
DSB	Defense Service Board
DSWA	Defense Special Weapons Agency
DTIC	Defense Technical Information Center
EFX	Expeditionary Force Experiment
F/A18-C/D, F14, F15, F16	Fighter Aircraft
FFRDC	Federally Funded Research Development Center
FS	Force Structure or Fellow, Military Operations Research Society

FYDP	Five Year Defense Program
GCAM	General Campaign Analyses Model
HQ	Headquarters
I&W	Indications and Warning
IDA	Institute for Defense Analyses
IO	Information Operations
ISR	Intelligence, Surveillance and Reconnaissance
J-1	Manpower and Personnel Directorate, Joint Staff
J-3	Operations Directorate, Joint Staff
J-4	Logistics Directorate, Joint Staff
J-5	Plans Directorate, Joint Staff
J-8	Director for Force Structure, Resource and Assessment, Joint Staff
JAMIP	Joint Analysis Model Improvement Program
JCS	Joint Chiefs of Staff
JDS	Joint Data Support
JHU/APL	Johns Hopkins University/Applied Physics Lab
JMD	Joint Missile Defense
JS	Joint Staff
JSCAP	Joint Strategic Capabilities Plan
JSIMS	Joint Simulations Systems
JSTARS	Joint Surveillance Target Attack Radar System
JTF	Joint Task Force
JV	Joint Vision
JWAC	Joint Warfare Analysis Center
JWARS	Joint Warfighting System
KPP	Performance Parameters
LIC	Low Intensity Conflict
LMSR	Large, Medium Speed Roll-on/Roll-off (Sea Mobility Platform)
LP	Linear Program
LRC	Lesser Regional Contingency
M&S	Models and Simulations
M1, M1A2	Tanks
MCO	Military Contingency Operations
MEF	Marine Expeditionary Force
MOE	Measures of Effectiveness
MOOTW	Military Operations Other Than War
MOP	Measure of Performance
MRC	Major Regional Contingency
MRS-BURU	Mobility Requirements Study/Bottom Up Review Updated
MTOF	Mission Task Organized Forces
MTW	Major Theater of War
N81	Assessment Division, Office Chief of Naval Operations
NATO	North Atlantic Treaty Organization
NBC	Nuclear, Biological, Chemical
NDP	National Defense Panel
NEO	Non-combatant Evacuation Operation

NGO	Non Governmental Organization
NMD	National Missile Defense
NMS	National Military Strategy
NSS	Naval Simulation System
O&M	Operations and Maintenance
OOTW	Operations Other Than War
OPLAN	Operations Plan
OPTEMPO	Operational Tempo
OR	Operations Research
OSD	Office Secretary of Defense
OUSDP	Office of the Under Secretary of Defense Policy
PA&E	Program Analysis and Evaluation (Directorate)
PD	Probability of Damage
PERSTEMPO	Personnel tempo
PGM	Precision-Guided Munitions
POM	Program Objective Memorandum
PY98	Program Year 1998
QDR	Quadrennial Defense Review
QOL	Quality of Life
QPIG	QDR Planning and Integration Group
GRAM	Quick Response Analysis Methodology
R&D	Research and Development
RBA	Revolution in Business Affairs
RC	Reserve Component
RMA	Revolution in Military Affairs
S&T	Scientific and Technical
S&TR	Strategy and Threat Reduction
SATCOM	Satellite Communications
SBIRS	Space Based Infrared System
SCN	Satellite Control Network
SEADWR	Sea Deployment Model
SEAPWR	Sea Power Model
SEASTATE	Sea State Model
SecDef	Secretary of Defense
SOF	Special Operations Forces
SSC	Small Scale Contingency
SWA	Southwest Asia
TACAIR	Tactical Air
TACWAR	Tactical Warfare Model
TAMD	Theater Air and Missile Defense
TASC	The Analytic Services Corporation
TFW	Tactical Fighter Wing
TMD	Theater Missile Defense
TRADOC	Training and Doctrine Command
TRANSCOM	Transportation Command
UAV	Unmanned Ariel Vehicle

USD	Under Secretary of Defense
USG	United States Government
USMC	United States Marine Corps
USN	United States Navy
USNPGS	United States Naval Postgraduate School
V22	Vertical Take-off and Landing Aircraft
VV&A	Verification, Validation and Accreditation
VX	Nerve Agent
WMD	Weapons of Mass Destruction